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JANUARY 1948
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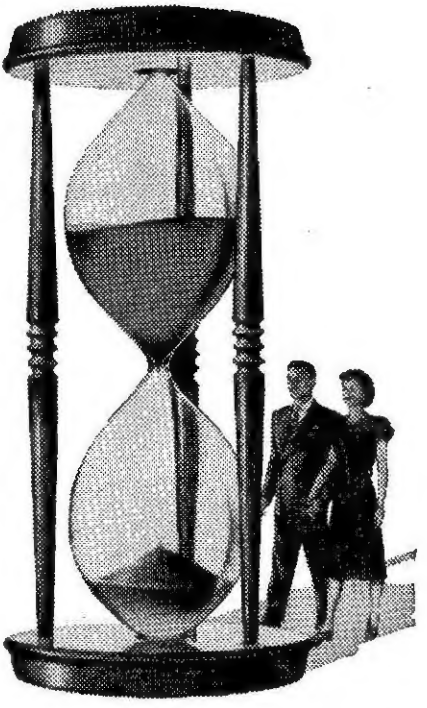
NOW YOU SEE IT BY ISAAC ASIMOV

STREET & SMITH'S SCIENCE FICTION JANUARY 1948

The years melt away

(as the years always do)



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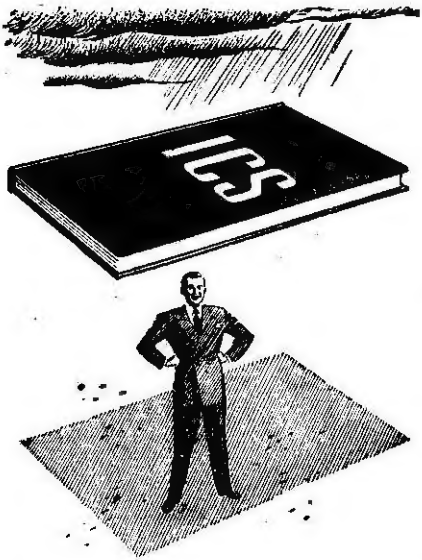

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HIGH SPEED PILE

The recent announcement of the high-speed neutron pile at Los Alamos, like many atomic science announcements, is a little difficult to evaluate. The Oak Ridge and Hanford piles, the piles at Argonne National Laboratory in Chicago, and the Canadian pile at Chalk River, are all different—and to a degree that's not immediately obvious.

The piles at Hanford are, of course, "factory" piles—commercial-production jobs, as distinct from research or laboratory piles. They were built to produce plutonium, no knowledge. They are water-cooled, graphite-moderated piles working at extremely high-energy levels—millions of kilowatt-hours.

At Oak Ridge is the first of the large-scale laboratory piles; it was the one which first produced plutonium, and yielded knowledge of high-energy-level piles, since it was operated at kilowatt power levels before the first Hanford pile was completed. It's a graphite-moderated, air-cooled pile using purified natural uranium. It's a laboratory pile, however, designed primarily to supply knowledge of plutonium manufacture. It has some utility as a research tool, and can produce a small quantity of radioisotopes. Its production of wanted isotopes is very limited however, since it was designed for plutonium-production research. In plutonium production, all available neutrons not essential to maintaining the chain fission reaction must be used in transmuting U-238 to plutonium. A pile designed with this in mind will have such uranium slug spacing, et cetera, as to barely operate at all; even a slight absorption of neutrons in something other than U-238 will cause a neutron deficiency, and the atomic fire will go out. Hence, putting in nitrogen salts, say, for C-14 production will lower the available neutrons: only a very small quantity can be put in such a pile.

At Argonne National Laboratory, there is a heavy-water moderated pile; here the heavy-water serves both as moderator and cooling agent, allowing fairly high power-level operation. Since heavy-hydrogen—in the heavy water—is a far more efficient moderating agent than graphite, more neutrons are avail-

able for reactions other than maintaining the fission reaction. Also, because the water can be pumped, and uranium slugs moved freely through it, slug-arrangements can be varied in a manner impossible with graphite-block piles. The Argonne pile is a far more flexible unit, far more of a research tool, and more valuable for producing knowledge.

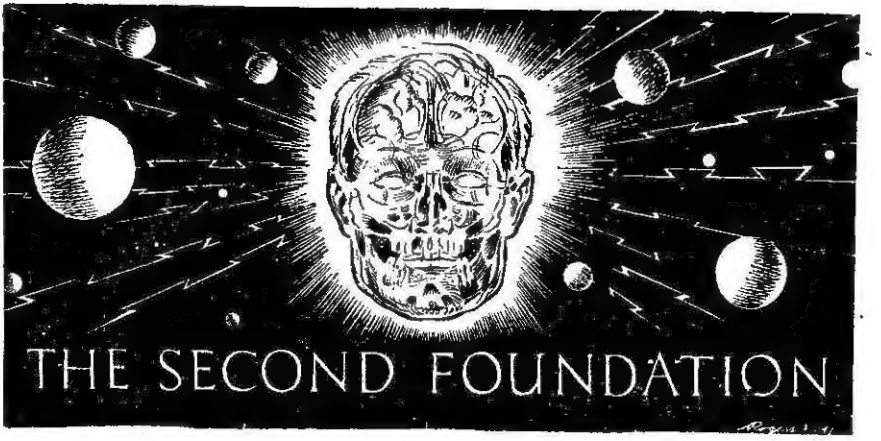
All these piles use purified natural uranium, containing somewhat less than 1% U-235 and better than 99% U-238. Chalk River, Canada, has a heavy-water moderated pile using somewhat enriched uranium; a slight amount of purified, separated U-235 is added to the natural uranium slugs used in the pile. Still more neutrons can be taken from this pile for research purposes without quenching the atomic fires. The heavy-water moderator makes it flexible, capable of operation at high-energy levels.

Finally, at Los Alamos, an entirely different type of atomic pile has been set up. This uses no moderator whatever, and the fuel is pure U-235 or plutonium. It's purely a research tool, but an exceedingly potent one. For one thing, in any moderated pile only *slow* neutrons —"moderate" neutrons— are available. In the unmoderated pile, both slow and fast neutrons are available for research work. Second, huge quantities of neutrons can be absorbed in experimental material without damping the fierce reaction of pure U-235. This unmoderated pile represents the most powerful atomic research tool in the whole uranium field today. It is flexible, almost unlimited in energy level, in neutron production, and in control.

It is, incidentally, nonexplosive. Making U-235 explode is not a thing accomplished accidentally; it takes planning and very special mechanism. Avoiding an explosion, on the other hand, is simple. In an unmoderated pile, subcritical masses of U-235 or Pu-239 are brought near each other—inside massive, ray-proof shielding, of course, by means of machinery. If someone started the machinery bringing the pieces together, and let it run until they actually made direct contact—the condition of atomic explosion—the U-235 itself would see to it there was no dangerous blast, and would actually, automatically, cut off the reaction altogether!

What would happen is easily foreseen. As the U-235 masses approached, the rate of reaction would mount on an extremely steep exponential curve. It would increase a millionfold in millionths of a second, when short distances were involved. But long before the explosive stage was reached, the enormous energy production in each of the masses will raise the temperature to thousands, then tens of thousands of degrees. By that time, of course, the uranium masses will have been volatilized with a gentle *pouuuff*, and distilled away. And that, of course, means that the masses have been dispersed and scattered into the maximum possible volume at the minimum possible concentration—which stops the reaction.

THE EDITOR.



NOW YOU SEE IT...

***The** Mule had to find that Second Foundation. And, because of his power, the Second Foundation couldn't let him. But because he ruled most of the Galaxy, and had certain special powers, the Mule wasn't easily stopped—*

BY ISAAC ASIMOV

Illustrated by Rogers

"After the definite break-up of the first Galactic Empire, it was the combination of worlds under the personal rule of that strange personality known to his times as 'The Mule' that first presents history with a unified volume of space truly imperial in scope. The earlier commercial empire of the Foundation had been diverse and loosely knit, despite the impalpable backing of the predictions of psychohistory. It was not to be compared with the tightly controlled 'Union of Worlds' under the Mule, comprising as it did one tenth the volume of the Galaxy and one-fifteenth of its population—"

"Essays on History"
—Ligurn Vier

I.

There is much more that Ligurn Vier has to say on the subject of the Mule and his Empire but almost all of it is not germane to the issue at immediate hand, and most of it is considerably too dry for our purposes in any case. Mainly, he is concerned with the economic conditions that led to the rise of the "First Citizen of the Union"—the Mule's official title—and with the economic consequences thereof.

If, at any time, he is mildly astonished over the colossal haste with which "that strange personality" rose from nothing to vast dominion in five years, he conceals it. If he is further surprised at the sudden cessation of expansion in favor of a five-year consolidation of territory, he hides the fact.

We therefore abandon Vier and continue on our own path for our own purposes and take up the history of the Great Interregnum—between the First and Second Galactic Empires—at the end of that five years of consolidation.

Politically, the Union is quiet. Economically, it is prosperous. Few would care to exchange the peace of the Mule's steady grip for the chaos that had preceded. On the worlds which five years previously had known the Foundation, there might be a nostalgic regret, but no more. The Foundation's leaders were dead, where useless; and Converted, where useful.

And of the Converted, the most useful was Han Pritcher, now lieutenant general.

In the days of the Foundation, Han Pritcher had been a captain and a member of the underground Democratic Opposition. When the Foundation fell to the Mule without a fight, Pritcher fought the Mule. Until, that is, he was Converted.

The Conversion was not the ordinary one brought on by the power of superior reason. Han Pritcher knew that well enough. He had been changed because the Mule was a mutant with mental powers quite capable of adjusting the emotions of ordinary humans to suit himself. But that satisfied him completely. That was as it should be. The very contentment with the Conversion was a prime symptom of it, but Han Pritcher was no longer even curious about the matter.

And now that he was returning from his fifth major expedition into the boundlessness of the Galaxy outside the Union, it was with something approaching artless joy that the veteran spaceman and Intelligence agent considered his approaching audience with the "First Citizen." His hard face, gouged out of a dark, grainless wood that did not seem to be capable of smiling without cracking, didn't show it—but the outward indications were unnecessary. The Mule could see the emotions within, down to the smallest, much as an ordinary man could see the twitch of an eyebrow.

Pritcher left his air car at the old vice-regal hangars and entered the palace grounds on foot as was

required. He walked one mile along the arrowed highway—which was empty and silent. Pritcher knew that over the square miles of palace grounds, there was not one guard, not one soldier, not one armed man.

The Mule had need of no protection.

The Mule was his own best, all-powerful protector.

Pritcher's footsteps beat softly in his own ears, as the palace reared its gleaming, incredibly light and incredibly strong metallic walls before him in the daring, overblown, near-hectic arches that characterized the architecture of the Late Empire. It brooded strongly over the empty grounds, over the crowded city on the horizon.

Within the palace was that one man—by himself—on whose inhuman mental attributes depended the new aristocracy, and the whole structure of the Union.

The huge, smooth door swung massively open at the general's approach, and he entered. He stepped on to the wide, sweeping ramp that moved upward under him. He rose swiftly in the noiseless elevator. He stood before the small plain door of the Mule's own room in the highest glitter of the palace spires.

It opened—

Bail Channis was young, and Bail Channis was Unconverted. That is, in plainer language, his emotional make-up had been unadjusted by the Mule. It remained exactly as it had been formed by the original shape of its heredity and the subsequent modifications of his environment. And that satisfied him, too.

At not quite thirty, he was in marvelously good odor in the capital. He was handsome and quick-witted—therefore successful in society. He was intelligent and self-possessed—therefore successful with the Mule. And he was thoroughly pleased at both successes.

And now, for the first time, the Mule had summoned him to personal audience.

His legs carried him down the long, glittering highway that led tautly to the sponge-aluminum spires that had been once the residence of the viceroy of Kalgan, who ruled under the old emperors; and that had been later the residence of the independent princes of Kalgan, who ruled in their own name; and that was now the residence of the First Citizen of the Union, who ruled over an empire of his own.

Channis hummed softly to himself. He did not doubt what this was all about. The Second Foundation, naturally! That all-embracing bogey, the mere consideration of which had thrown the Mule back from his policy of limitless expansion into static caution. The official term was "consolidation."

Now there were rumors — you couldn't stop rumors. The Mule was to begin the offensive once more. The Mule had discovered

the whereabouts of the Second Foundation, and would attack. The Mule had come to an agreement with the Second Foundation and divided the Galaxy. The Mule had decided the Second Foundation did not exist and would take over all the Galaxy.

No use listing all the varieties one heard in the anterooms. It was not even the first time such rumors had circulated. But now they seemed to have more body in them, and all the free, expansive souls who thrived on war, military adventure, and political chaos and withered in times of stability and stagnant peace were joyful.

Bail Channis was one of these. He did not fear the mysterious Second Foundation. For that matter, he did not fear the Mule, and boasted of it. Some, perhaps, who disapproved of one at once so young and so well-off, waited darkly for the reckoning with the gay ladies' man who employed his wit openly at the expense of the Mule's physical appearance and sequestered life. None dared join him and few dared laugh, but when nothing happened to him, his reputation rose accordingly.

Channis was improvising words to the tune he was humming. Nonsense words with the recurrent refrain: "Second Foundation threatens the Nation and all of Creation."

He was at the palace.

The huge, smooth door swung massively open at his approach and he entered. He stepped on to the wide, sweeping ramp that moved upward under him. He rose swiftly in the noiseless elevator. He stood before the small plain door of the Mule's own room in the highest glitter of the palace spires.

It opened—

The man who had no name other than the Mule, and no title other than First Citizen looked out through the one-way transparency of the wall to the light and lofty city on the horizon.

In the darkening twilight, the stars were emerging, and not one but owed allegiance to him.

He smiled with fleeting bitterness at the thought. The allegiance they owed was to a personality few had ever seen.

He was not a man to look at, the Mule—not a man to look at without derision. Not more than one hundred and twenty pounds was stretched out into his five-foot-eight length. His limbs were bony stalks that jutted out of his scrawniness in graceless angularity. And his thin face was nearly drowned out in the prominence of a fleshy beak that thrust three inches outward.

Only his eyes played false with the general farce that was the Mule. In their softness—a strange softness for the Galaxy's greatest conqueror—sadness was never entirely subdued.

In the city was to be found all the gaiety of a luxurious capital on a luxurious world. He might have established his capital on the Foundation, the strongest of his

now-conquered enemies, but it was far out on the very rim of the Galaxy. Kalgan, centrally located, with a long tradition as aristocracy's playground, suited him better—strategically.

But in its traditional gaiety, enhanced by unheard-of prosperity, he found no peace.

They feared him and obeyed him and, perhaps, even respected him—from a goodly distance. But who could look at him without contempt? Only those he had Converted. And of what value was their artificial loyalty? It lacked flavor. He might have adopted titles, and enforced ritual and invented elaborations, but even that would have changed nothing. Better—or at least, no worse—to be simply the First Citizen—and to hide himself.

There was a sudden surge of rebellion within him—strong and brutal. Not a portion of the Galaxy must be denied him. For five years he had remained silent and buried here on Kalgan because of the eternal, misty, space-ridden menace of the unseen, unheard, unknown Second Foundation. He was thirty-two. Not old—but he felt old. His body, whatever its mutant mental powers, was physically weak.

Every star! Every star he could see—and every star he couldn't see. It must all be his!

Revenge on all. On a humanity of which he wasn't a part. On a Galaxy in which he didn't fit.

The cool, overhead warning light flickered. He could follow the progress of the man who had entered the palace, and simultaneously, as though his mutant sense had been enhanced and sensitized in the lonely twilight, he felt the wash of emotional content touch the fibers of his brain.

He recognized the identity without an effort. It was Pritcher.

Captain Pritcher of the one-time Foundation. The Captain Pritcher who had been ignored and passed over by the bureaucrats of that decaying government. The Captain Pritcher whose job as petty spy he had wiped out and whom he had lifted from its slime. The Captain Pritcher whom he had made first colonel and then general; whose scope of activity he had made Galaxy-wide.

The now-General Pritcher who was, iron rebel though he began, completely loyal. And yet with all that, not loyal because of benefits gained, not loyal out of gratitude, not loyal as a fair return—but loyal only through the artifice of Conversion.

The Mule was conscious of that strong unalterable surface layer of loyalty and love that colored every swirl and eddy of the emotionality of Han Pritcher—the layer he had himself implanted five years before. Far underneath there were the original traces of stubborn individuality, impatience of rule, idealism—but even he, himself, could scarcely detect them any longer.

The door behind him opened, and he turned. The transparency of the wall faded to opacity, and

the purple evening light gave way to the whitely blazing glow of atomic power.

Han Pritcher took the seat indicated. There was neither bowing, nor kneeling nor the use of honorifics in private audiences with the Mule. The Mule was merely "First Citizen." He was addressed as "sir." You sat in his presence, and you could turn your back on him if it so happened that you did.

To Han Pritcher this was all evidence of the sure and confident power of the man. He was warmly satisfied with it.

The Mule said: "Your final report reached me yesterday. I can't deny that I find it somewhat depressing, Pritcher."

The general's eyebrows closed upon each other: "Yes, I imagine so—but I don't see to what other conclusions I could have come. There just isn't any Second Foundation, sir."

And the Mule considered and then slowly shook his head, as he had done many a time before: "There's the evidence of Ebling Mis. There is always the evidence of Ebling Mis."

It was not a new story. Pritcher said without qualification: "Mis may have been the greatest psychologist of the Foundation, but he was a baby compared to Hari Seldon. At the time he was investigating Seldon's works, he was under the artificial stimulation of your own brain control. You may have pushed him too far. He might have been wrong. Sir, he *must* have been wrong."

The Mule sighed, his lugubrious face thrust forward on its thin stalk of a neck. "If only he had lived another minute. He was on the point of telling me where the Second Foundation was. He *knew*, I'm telling you. I need not have retreated. I need not have waited and waited. So much time lost. Five years gone for nothing."

Pritcher could not have been censorious over the weak longing of his ruler; his controlled mental make-up forbade that. He was disturbed instead; vaguely uneasy. He said: "But what alternative explanation can there possibly be, sir? Five times I've gone out. You yourself have plotted the routes. And I've left no asteroid unturned. It was three hundred years ago—that Hari Seldon of the old Empire supposedly established two Foundations to act as nuclei of a new Empire to replace the dying old one. One hundred years after Seldon, the First Foundation—the one we know so well—was known through all the Periphery. One hundred fifty years after Seldon—at the time of the last battle with the old Empire—it was known throughout the Galaxy. And now it's three hundred years—and where should this mysterious Second be? In no eddy of the Galactic stream has it been heard of."

"Ebling Mis said it kept itself secret. Only secrecy can turn its weakness to strength."

"Secrecy as deep as this is past

possibility without nonexistence as well."

The Mule looked up, large eyes sharp and wary. "No. It *does* exist." A bony finger pointed sharply. "There is going to be a slight change in tactics."

Pritcher frowned. "You plan to leave yourself? I would scarcely advise it."

"No, of course not. You will have to go out once again—one last time. But with another in joint command."

There was a silence, and Pritcher's voice was hard, "Who, sir?"

"There's a young man here in Kalgan. Bail Channis."

"I've never heard of him, sir."

"No, I imagine not. But he's got an agile mind, he's ambitious—and he's *not* Converted."

Pritcher's long jaw trembled for a bare instant, "I fail to see the advantage in that."

"There is one, Pritcher. You're a resourceful and experienced man. You have given me good service. But you are Converted. Your motivation is simply an enforced and helpless loyalty to myself. When you lost your native motivations, you lost something, some subtle drive, that I cannot possibly replace."

"I don't feel that, sir," said Pritcher, grimly. "I recall myself quite well as I was in the days when I was an enemy of yours. I feel none the inferior."

"Naturally not," and the Mule's mouth twitched into a smile. "Your judgment in this matter is scarcely objective. This Channis, now, is ambitious—for himself. He is completely trustworthy—out of no loyalty but to himself. He knows that it is on my coat-tails that he rides and he would do anything to increase my power that the ride might be long and far and that the destination might be glorious. If he goes with you, there is just that added push behind *his* seeking—that push for himself."

"Then," said Pritcher, still insistent, "why not remove my own Conversion, if you think that will improve me. I can scarcely be mistrusted, now."

"That never, Pritcher. While you are within arm's reach, or blaster reach, of myself, you will remain firmly held in Conversion. If I were to release you this minute, I would be dead the next."

The general's nostrils flared. "I am hurt that you should think so."

"I don't mean to hurt you, but it is impossible for you to realize what your feelings would be if free to form themselves along the lines of your natural motivation. The human mind resents control. The ordinary human hypnotist cannot hypnotize a person against his will for that reason. I can, because I'm not a hypnotist, and, believe me, Pritcher, the resentment that you cannot show and do not even know you possess is something I wouldn't want to face."

Pritcher's head bowed. Futility wrenched him and left him gray and haggard inside. He said with an effort: "But how can you trust this man. I mean, completely—as

you can trust me in my Conversion."

"Well, I suppose I can't entirely. That is why you must go with him. You see, Pritcher," and the Mule buried himself in the large armchair against the soft back of which he looked like an angularly animated toothpick, "if he *should* stumble on the Second Foundation —if it *should* occur to him that an arrangement with them might be more profitable than with me— You understand?"

A profoundly satisfied light blazed in Pritcher's eyes. "That is better, sir."

"Exactly. But remember, he must have a free rein as far as possible."

"Certainly."

"And. . . . uh . . . Pritcher. The young man is handsome, pleasant, and extremely charming. Don't let him fool you. He's a dangerous and unscrupulous character. Don't get in his way unless you're prepared to meet him properly. That's all."

The Mule was alone again. He let the lights die and the wall before him kicked to transparency again. The sky was purple now, and the city was a smudge of light on the horizon.

What was it all for? And if he *were* the master of all there was— what then? Would it really stop men like Pritcher from being straight and tall, self-confident, strong? Would Bail Channis lose his looks? Would he himself be other than he was?

He cursed his doubts. What was he really after?

The cool, overhead warning light flickered. He could follow the progress of the man who had entered the palace and, almost against his will, he felt the soft wash of emotional content touch the fibers of his brain.

He recognized the identity without an effort. It was Channis. Here the Mule saw no uniformity, but the primitive diversity of a strong mind, untouched and unmolded except by the manifold disorganizations of the Universe. It writhed in floods and waves. There was caution on the surface, a thin, smoothing effect, but with touches of cynical ribaldry in the hidden eddies of it. And underneath there was the strong flow of self-interest and self-love, with a gush of cruel humor here and there, and a deep, still pool of ambition underlying all.

The Mule felt that he could reach out and dam the current, wrench the pool from its basin and turn it in another course, dry up one flow and begin another. But what of it? If he could bend Channis' curly head in the profoundest adoration, would that change his own grotesquerie that made him shun the day and love the night, that made him a recluse inside an empire that was unconditionally his?

The door behind him opened, and he turned. The transparency of the wall faded to opacity, and the darkness gave way to the

whitely blazing artifice of atomic power.

Bail Channis sat down lightly and said: "This is a not-quite-unexpected honor, sir."

The Mule rubbed his proboscis with all four fingers at once and sounded a bit irritable in his response. "Why, so, young man?"

"A hunch, I suppose. Unless I want to admit that I've been listening to rumors."

"Rumors? Which one of the several dozen varieties are you referring to?"

"Those that say a renewal of the Galactic Offensive is being planned. It is a hope with me that such is true and that I might play an appropriate part."

"Then you think there *is* a Second Foundation?"

"Why not? It would make things so much more interesting."

"And you find interest in it as well?"

"Certainly. In the very mystery of it! What better subject could you find for conjecture? The newspaper supplements are full of nothing else lately—which is probably significant. The *Cosmos* had one of its feature writers compose a weirdie about a world consisting of beings of pure mind—the Second Foundation, you see—who had developed mental force to energies large enough to compete with any known to physical science. Spaceships could be blasted light-years away, planets could be turned out of their orbits—"

"Interesting. Yes. But do *you* have any notions on the subject? Do you subscribe to this mind-power notion?"

"Galaxy, no! Do you think creatures like that would stay on their own planet? No, sir. I think the Second Foundation remains hidden because it is weaker than we think."

"In that case, I can explain myself very easily. How would you like to head an expedition to locate the Second Foundation?"

For a moment Channis seemed caught up by the sudden rush of events at just a little greater speed than he was prepared for. His tongue had apparently skidded to a halt in a lengthening silence.

The Mule said dryly: "Well?"

Channis corrugated his forehead. "Certainly. But where am I to go? Have you any information available?"

"General Pritcher will be with you—"

"Then I'm *not* to head it?"

"Judge for yourself when I'm done. Listen, you're not of the Foundation. You're a native of Kalgan, aren't you? Yes. Well, then, your knowledge of the Seldon plan may be vague. When the first Galactic Empire was falling, Hari Seldon and a group of psychohistorians, analyzing the future course of history by mathematical tools no longer available in these degenerate times, set up two Foundations, one at each end of the Galaxy, in such a way that the economic and sociological forces that were slowly evolving, would make them serve as foci for the

Second Empire. Hari Seldon planned on a thousand years to accomplish that—and it would have taken thirty thousand without the Foundations. But he couldn't count on *me*. I am a mutant and I am unpredictable by psychohistory which can only deal with the average reactions of numbers. Do you understand?"

Second Foundation. So I must know more about it. General Pritcher is of the definite opinion that it does not exist at all. I know otherwise."

Channis said delicately: "How do you know, sir?"

And the Mule's words were suddenly liquid indignation: "Because minds under my control have been

"Perfectly, sir. But how does that involve me?"

"You'll understand shortly. I intend to unite the Galaxy now—and reach Seldon's thousand-year goal in three hundred. One Foundation—the world of physical scientists—is still flourishing, under *me*. Under the prosperity and order of the Union, the atomic weapons they have developed are capable of dealing with anything in the Galaxy—except perhaps the

interfered with. Delicately! Subtly! But not so subtly that I couldn't notice. And these interferences are increasing, and hitting valuable men at important times. Do you wonder now that a certain discretion has kept me motionless these years?

"That is your importance. General Pritcher is the best man left me, so he is no longer safe. Of course, he does not know that. But *you* are Unconverted and

therefore not instantly detectable as a Mule's man. You may fool the Second Foundation longer than one of my own men would—perhaps just sufficiently longer. Do you understand?"

"Um-m-m. Yes. But pardon me, sir, if I question you. How are these men of yours disturbed, so that I might detect change in General Pritcher, in case any occurs. Are they Unconverted again? Do they become disloyal?"

"No. I told you it was subtle. It's more disturbing than that, because it's harder to detect and sometimes I have to wait before acting, uncertain whether a key man is being normally erratic or has been tampered with. Their loyalty is left intact, but initiative and ingenuity are rubbed out. I'm left with a perfectly normal person, apparently, but one completely useless. In the last year, six have been so treated. Six of my best." A corner of his mouth lifted. "They're in charge of training bases now—and my most earnest wishes go with them that no emergencies come up for them to decide upon."

"Suppose, sir . . . suppose it were not the Second Foundation. What if it were another, such as yourself—another mutant?"

"The planning is too careful, too long range. A single man would be in a greater hurry. No, it is a world, and you are to be my weapon against it."

Channis' eyes shone as he said: "I'm delighted at the chance."

But the Mule caught the sudden emotional upwelling. He said: "Yes, apparently it occurs to you, that you will perform a unique service, worthy of a unique reward—perhaps even that of being my successor. Quite so. But there are unique punishments, too, you know. My emotional gymnastics are not confined to the creation of loyalty alone."

And the little smile on his thin lips was grim, as Channis leaped out of his seat in horror.

For just an instant, just one, flashing instant, Channis had felt the pang of an overwhelming grief close over him. It had slammed down with a physical pain that had blackened his mind unbearably, and then lifted. Now nothing was left but the strong wash of anger.

The Mule said: "Anger won't help . . . yes, you're covering it up now, aren't you? But I can see it. So just remember—*that* sort of business can be made more intense and kept up. I've killed men by emotional control, and there's no death crueler."

He paused: "That's all!"

The Mule was alone again. He let the lights die and the wall before him kicked to transparency again. The sky was black, and the rising body of the Galactic Lens was spreading its bespanglement across the velvet depths of space.

All that haze of nebula was a mass of stars so numerous that they melted one into the other and left nothing but a cloud of light.

And all to be his—

And now but one last arrangement to make, and he could sleep.

INTERLUDE

The Executive Council of the Second Foundation was in session. To us they are merely voices. Neither the exact scene of the meeting nor the identity of those present are essential at the point.

Nor, strictly speaking, can we even consider an exact reproduction of any part of the session—unless we wish to sacrifice completely even the minimum comprehensibility we have a right to expect.

We deal here with psychologists—and not merely psychologists. Let us say, rather, scientists with a psychological orientation. That is, men whose fundamental conception of scientific philosophy is pointed in an entirely different direction from all of the orientations we know. The "psychology" of scientists brought up among the axioms deduced from the observational habits of physical science has only the vaguest relationship to PSYCHOLOGY.

Which is about as far as I can go in explaining color to a blind man—with myself as blind as the audience.

The point being made is that the minds assembled understood thoroughly the workings of each other, not only by general theory but by the specific application over a long period of these theories to particular individuals. Speech as known to us was unnecessary. A fragment of a sentence amounted almost to long-winded redundancy. A gesture, a grunt, the curve of a facial line—even a significantly timed pause yielded informational juice.

The liberty is taken, therefore, of freely translating a small portion of the conference into the extremely specific word-combinations necessary to minds oriented from childhood to a physical science philosophy, even at the risk of losing the more delicate nuances.

There was one "voice" predominant, and that belonged to the individual known simply as the First Speaker.

He said: "It is apparently quite definite now as to what stopped the Mule in his first mad rush. I can't say that the matter reflects credit upon . . . well, upon the organization of the situation. Apparently, he almost located us, by means of the artificially heightened brain-energy of what they call a 'psychologist' on the First Foundation. This psychologist was killed just before he could communicate his discovery to the Mule. The events leading to that killing were completely fortuitous for all calculations below Phase Three. Suppose you take over."

It was the Fifth Speaker who was indicated by an inflection of the voice. He said, in grim nuances: "It is certain that the situation was mishandled. We are, of course, highly vulnerable under mass attack, particularly an attack led by such a mental phenomenon as the Mule. Shortly after he first achieved Galactic eminence with the conquest of the First Founda-

whitely blazing artifice of atomic power.

Bail Channis sat down lightly and said: "This is a not-quite-unexpected honor, sir."

The Mule rubbed his proboscis with all four fingers at once and sounded a bit irritable in his response. "Why, so, young man?"

"A hunch, I suppose. Unless I want to admit that I've been listening to rumors."

"Rumors? Which one of the several dozen varieties are you referring to?"

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"Why not? It would make things so much more interesting."

"And you find interest in it as well?"

"Certainly. In the very mystery of it! What better subject could you find for conjecture? The newspaper supplements are full of nothing else lately—which is probably significant. The *Cosmos* had one of its feature writers compose a weirdie about a world consisting of beings of pure mind—the Second Foundation, you see—who had developed mental force to energies large enough to compete with any known to physical science. Spaceships could be blasted light-years away, planets could be turned out of their orbits—"

"Interesting. Yes. But do *you* have any notions on the subject? Do you subscribe to this mind-power notion?"

"Galaxy, no! Do you think creatures like that would stay on their own planet? No, sir. I think the Second Foundation remains hidden because it is weaker than we think."

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"Judge for yourself when I'm done. Listen, you're not of the Foundation. You're a native of Kalgan, aren't you? Yes. Well, then, your knowledge of the Seldon plan may be vague. When the first Galactic Empire was falling, Hari Seldon and a group of psychohistorians, analyzing the future course of history by mathematical tools no longer available in these degenerate times, set up two Foundations, one at each end of the Galaxy, in such a way that the economic and sociological forces that were slowly evolving, would make them serve as foci for the

"Oh— Well, then drag up a chair, old man, and let's get into it. I've been going over your notes. I find them excellent."

"How . . . pleasant that you do."

"But I'm wondering if you've come to the conclusions I have. Have you ever tried analyzing the problem deductively? I mean, it's all very well to comb the stars at random, and to have done all you did in five expeditions is quite a bit of star-hopping. That's obvious. But have you calculated how long it would take to go through every known world at this rate?"

"Yes. Several times." Pritcher felt no urge to meet the young man halfway, but there was the importance of filching the other's mind— the other's uncontrolled, and hence, unpredictable, mind.

"Well, then, suppose we're analytical about it and try to decide just what we're looking for?"

"The Second Foundation," said Pritcher, grimly.

"A Foundation of psychologists," corrected Channis, "who are as weak in physical science as the First Foundation was weak in psychology. Well, you're from the First Foundation, which I'm not. The implications are probably obvious to you. We must find a world which rules by virtue of mental skills, and yet which is very backwards scientifically."

"Is that necessarily so?" questioned Pritcher, quietly. "Our own 'Union of Worlds' isn't backwards scientifically, even though our ruler owes his strength to his mental powers."

"Because he has the skills of the First Foundation to draw upon," came the slightly impatient answer, "and that is the only such reservoir of knowledge in the Galaxy. The Second Foundation must live among the dry crumbs of the broken Galactic Empire. There are no pickings there."

"So then you postulate mental power sufficient to establish their rule over a group of worlds and physical helplessness as well?"

"*Comparative* physical helplessness. Against the decadent neighboring areas, they are competent to defend themselves. Against the resurgent forces of the Mule, with his background of a mature atomic economy, they cannot stand. Else, why is their location so well-hidden, both at the start by the founder, Hari Seldon, and now by themselves. Your own First Foundation made no secret of its existence and did not have it made for them, when they were an undefended single city on a lonely planet three hundred years ago."

The smooth lines of Pritcher's dark face twitched sardonically. "And now that you've finished your deep analysis, would you like a list of all the kingdoms, republics, planet states and dictatorships of one sort of another in that political wilderness out there that correspond to your description and to several factors besides?"

"All this has been considered then?" Channis lost none of his brashness.

"You won't find it here, naturally, but we have a completely worked

out guide to the political units of the Opposing Periphery. Really, did you suppose the Mule would work entirely hit-and-miss?"

"Well, then," and the young man's voice rose in a burst of energy, "what of the Oligarchy of Tazenda?"

Pritcher touched his ear thoughtfully, "Tazenda? Oh, I think I know it. They're not in the Periphery, are they? It seems to me they're fully a third of the way towards the center of the Galaxy."

"Yes. What of that?"

"The records we have place the Second Foundation at the other end of the Galaxy. Space knows it's the only thing we have to go on. Why talk of Tazenda anyway? It's angular deviation from the First Foundation radian is only about one hundred ten to one hundred twenty degrees anyway. Nowhere near one hundred eighty."

"There's another point in the records. The Second Foundation was established at 'Star's End.'"

"No such region in the Galaxy has ever been located."

"Because it was a local name, suppressed later for greater secrecy. Or maybe one invented for the purpose by Seldon and his group. Yet there's some relationship between 'Star's End' and 'Tazenda,' don't you think?"

"A vague similarity in sound? Insufficient."

"Have you ever been there?"

"No."

"Yet it is mentioned in your records."

"Where? Oh, yes, but that was merely to take on food and water. There was certainly nothing remarkable about the world."

"Did you land at the ruling planet? The center of government?"

"I couldn't possibly say."

Channis brooded about it under the other's cold gaze. Then, "Would you look at the Lens with me for a moment?"

"Certainly."

The Lens was perhaps the newest feature of the interstellar cruisers of the day. Actually, it was a complicated calculating machine which could throw on a screen a reproduction of the night sky as seen from any given point of the Galaxy.

Channis adjusted the co-ordinate points and the wall lights of the pilot room were extinguished. In the dim red light at the control board of the Lens, Channis' face glowed ruddily. Pritcher sat in the pilot seat, long legs crossed, face lost in the gloom.

Slowly, as the induction period passed, the points of light brightened on the screen. And then they were thick and bright with the generously populated star-groupings of the Galaxy's center.

"This," explained Channis, "is the winter night-sky as seen from Trantor. That is the important point that, as far as I know, has been neglected so far in your search. All intelligent orientation must start from Trantor as zero point. Trantor was the capital of the Galactic Empire. Even more so scientifically and culturally, than politically. And, there-

fore, the significance of any descriptive name should stem, nine times out of ten, from a Trantorian orientation. You'll remember in this connection that, although Seldon was from Santanni, towards the Periphery, his group worked on Trantor itself."

"What is it you're trying to show me?" Pritcher's level voice plunged icily into the gathering enthusiasm of the other.

"The map will explain it. Do you see the dark nebula?" The shadow of his arm fell upon the screen, which took on the bespanglement of the Galaxy. The pointing finger ended on a tiny patch of black that seemed a hole in the speckled fabric of light. "The stellagraphical records call it Pelot's Nebula. Watch it. I'm going to expand the image."

Pritcher had watched the phenomenon of Lens Image expansion before but he still caught his breath. It was like being at the visiplate of a spaceship storming through a horribly crowded Galaxy without entering hyperspace. The stars diverged towards them from a common center, flared outwards and tumbled off the edge of the screen. Single points became double, then globular. Hazy patches dissolved into myriad points. And always that illusion of motion.

Channis spoke through it all, "You'll notice that we are moving along the direct line from Trantor to Pellot's Nebula, so that in effect we are still looking at a stellar orientation equivalent to that of Trantor. There is probably a slight error because of the gravitic deviation of light that I haven't the math to calculate for, but I'm sure it can't be significant."

The darkness was spreading over the screen. As the rate of magnification slowed, the stars slipped off the four ends of the screen in a regretful leave-taking. At the rims of the growing nebula, the brilliant universe of stars shone abruptly in token for that light which was merely hidden behind the swirling unradiating atom fragments of sodium and calcium that filled cubic parsecs of space.

And Channis pointed again, "This has been called 'The Mouth' by the inhabitants of that region of space. And that is significant because it is only from the Trantorian orientation that it looks like a mouth." What he indicated was a rift in the body of the Nebula, shaped like a ragged, grinning mouth in profile, outlined by the glazing glory of the starlight with which it was filled.

"Follow 'The Mouth,'" said Channis. "Follow 'The Mouth' towards the gullet as it narrows down to a thin, splintering line of light."

Again the screen expanded a trifle, until the Nebula stretched away from "The Mouth" to block off all the screen but that narrow trickle and Channis' finger silently followed it down, to where it straggled to a halt, and then, as his finger continued moving onward, to a spot where one single star sparked lonesomely; and there his finger halted. for beyond that was blackness, unrelieved.

"'Star's End,'" said the young

man, simply. "The fabric of the Nebula is thin there and the light of that one star finds its way through in just that one direction—to shine on Trantor."

"You're trying to tell me that—" the voice of the Mule's general died in suspicion.

"I'm not trying. That *is* Tazenda—Star's End."

The lights went on. The Lens flicked off. Pritcher reached Channis in three long strides, "What made you think of this?"

And Channis leaned back in his chair with a queerly puzzled expression on his face. "It was accidental. I'd like to take intellectual credit for this, but it was only accidental. In any case, however it happens, it fits. According to our references, Tazenda is an oligarchy. It rules twenty-seven inhabited planets. It is not advanced scientifically. And most of all, it is an obscure world that has adhered to a strict neutrality in the local politics of that stellar region, and is not expansionist. I think we ought to see it."

"Have you informed the Mule of this?"

"No. Nor shall we. We're in space now, about to make the first hop."

Pritcher, in sudden horror, sprang to the visiplate. Cold space met his eyes when he adjusted it. He gazed fixedly at the view, then turned. Automatically, his hand reached for the hard, comfortable curve of the butt of his blaster.

"By whose order?"

"By my order, general"—it was the first time Channis had ever used the other's title—"while I was engaging you here. You probably felt no acceleration, because it came at the moment I was expanding the field of the Lens and you undoubtedly imagined it to be an illusion of the apparent star motion."

"Why? Just what are you doing? What was the point of your nonsense about Tazenda, then?"

"That was no nonsense. I was completely serious. We're going there. We left today because we were scheduled to leave three days from now. General, you don't believe there is a Second Foundation, and I do. *You* are merely following the Mule's orders without faith; *I* recognize a serious danger. The Second Foundation has now had five years to prepare. How they've prepared, I don't know, but what if they have agents on Kalgan. If I carry about in my mind the knowledge of the whereabouts of the Second Foundation, they may discover that. My life might be no longer safe, and I have a great affection for my life. Even on a thin and remote possibility such as that, I would rather play safe. So no one knows of Tazenda but you, and you found out only after we were out in space. And even so, there is the question of the crew." Channis was smiling again, ironically, in obviously complete control of the situation.

Pritcher's hand fell away from his blaster, and for a moment a vague discomfort pierced him. What kept *him* from action? What deadened *him!* There was a time when he was a rebellious and unpromoted

captain of the First Foundation's commercial empire, when it would have been *himself* rather than Channis who would have taken prompt and daring action such as that. Was the Mule right? Was his controlled mind so concerned with obedience as to lose initiative? He felt a thickening despondency drive him down into a strange lassitude.

He said, "Well done! However, you will consult me in the future before making decisions of this nature."

The flickering signal caught his attention.

"That's the engine room," said Channis, casually. "They warmed up on five minutes' notice and I asked them to let me know if there was any trouble. Want to hold the fort?"

Pritcher nodded mutely, and cogitated in the sudden loneliness on the evils of approaching fifty. The visiplate was sparsely starred. The main body of the Galaxy misted one end. What if he were free of the Mule's influence—

But he recoiled in horror at the thought.

Chief Engineer Huxlani looked sharply at the young, un-uniformed man who carried himself with the assurance of a Fleet officer and seemed to be in a position of authority. Huxlani, as a regular Fleet man from the days his chin had dripped milk, generally confused authority with specific insignia.

But the Mule had appointed this man, and the Mule was, of course, the last word. The only word for that matter. Not even subconsciously did he question that. Emotional control went deep.

He handed Channis the little oval object without a word.

Channis hefted it, and smiled engagingly.

"You're a Foundation man, aren't you, chief?"

"Yes, sir. I served in the Foundation Fleet eighteen years before the First Citizen took over."

"Foundation training in engineering?"

"Qualified Technician, First Class—Central School on Anacreon."

"Good enough. And you found this on the communication circuit, where I asked you to look?"

"Yes, sir."

"Does it belong there?"

"No, sir."

"Then what is it?"

"A hypertracer, sir."

"That's not enough. I'm not a Foundation man. What is it?"

"It's a device to allow the ship to be traced through hyperspace."

"In other words we can be followed anywhere."

"Yes, sir."

"All right. It's a recent invention, isn't it? It was developed by one of the Research Institutes set up by the First Citizen, wasn't it?"

"I believe so, sir."

"And its workings are a government secret. Right?"

"I believe so, sir."

"Yet here it is. Intriguing."

Channis tossed the hypertracer methodically from hand to hand for a few seconds. Then, sharply, he held it out, "Take it, then, and put

it back exactly where you found it and exactly how you found it. Understand? And then forget this incident. Entirely!"

The chief choked down his near-automatic salute, turned sharply and left.

The ship bounded through the Galaxy, its path a wide-spaced dotted line through the stars. The dots, referred to, were the scant stretches of ten to sixty light-seconds spent in normal space and between them stretched the hundred-and-up light-year gaps that represented the "hops" through hyperspace.

Bail Channis sat at the control panel of the Lens and felt again the involuntary surge of near-worship at the contemplation of it. He was not a Foundation man and the interplay of forces at the twist of a knob or the breaking of a contact was not second nature to him.

Not that the Lens ought quite to bore even a Foundation man. Within its unbelievably compact body were enough electronic circuits to pin point accurately a hundred million separate stars in exact relationship to each other. And as if that were not a feat in itself, it was further capable of translating any given portion of the Galactic Field along any of the three spatial axes or to rotate any portion of the Field about a center.

It was because of that, that the Lens had performed a near-revolution in interstellar travel. In the younger days of interstellar travel, the calculation of each "hop" through hyperspace meant any amount of work from a day to a week—and the larger portion of such work was the more or less precise calculation of "Ship's Position" on the Galactic scale of reference. Essentially that meant the accurate observation of at least three widely-spaced stars, the position of which, with reference to the arbitrary Galactic triple-zero, were known.

And it is the word "known," that is the catch. To any who know the star field well from one certain reference point, stars are as individual as people. Jump ten parsecs, however, and not even your own sun is recognizable. It may not even be visible.

The answer was, of course, spectroscopic analysis. For centuries, the main object of interstellar engineering was the analysis of the "light signature" of more and more stars in greater and greater detail. With this, and the growing precision of the "hop" itself, standard routes of travel through the Galaxy were adopted and interstellar travel became less of an art and more of a science.

And yet, even under the Foundation, however, with improved calculating machines and the new method of mechanically scanning the star field for a known "light signature," it sometimes took days to locate three stars and then calculate position in regions not previously familiar to the pilot.

It was the Lens that changed all that. For one thing it required only a single known star. For another, even a space tyro such as Channis could operate it.

The nearest sizable star at the moment was Vincetori, according to "hop" calculations, and on the visiplate now, a bright star was centered. Channis hoped that it was Vincetori.

The field screen of the Lens was thrown directly next that of the visiplate and with careful fingers, Channis punched out the co-ordinates of Vincetori. He closed a relay, and the star field sprang to bright view. In it, too, a bright star was centered, but otherwise there seemed no relationship. He adjusted the Lens along the Z-Axis and expanded the Field to where the photometer showed both centered stars to be of equal brightness.

Channis looked for a second star, sizably bright, on the visiplate and found one on the field screen to correspond. Slowly, he rotated the screen to similar angular deflection. He twisted his mouth and rejected the result with a grimace. Again he rotated and another bright star was brought into position, and a third. And then he grinned. That did it. Perhaps a specialist with trained relationship perception might have clicked first try, but he'd settle for three.

That was the adjustment. In the final step, the two fields overlapped and merged into a sea of not-quite-rightness. Most of the stars were close doubles. But the fine adjustment did not take long. The double stars melted together, one field remained, and the "Ship's Position" could now be read directly off the dials. The entire procedure had taken less than half an hour.

Channis found Han Pritcher in his private quarters. The general was quite apparently preparing for bed. He looked up.

"News?"

"Not particularly. We'll be at Tazenda in another hop."

"I know."

"I don't want to bother you if you're turning in, but have you looked through the film we picked up in Cil?"

Han Pritcher cast a disparaging look at the article in question, where it lay in its black case upon his low bookshelf, "Yes."

"And what do you think?"

"I think that if there was ever any science to History, it has been quite lost in this region of the Galaxy."

Channis grinned broadly, "I know what you mean. Rather barren, isn't it?"

"Not if you enjoy personal chronicles of rulers. Probably unreliable, I should say, in both directions. Where history concerns mainly personalities, the drawings become either black or white according to the interests of the writer. I find it all remarkably useless."

"But there is talk about Tazenda. That's the point I tried to make when I gave you the film. It's the only one I could find that even mentioned them."

"All right. They have good rulers and bad. They've conquered a few planets, won some battles, lost a few. There is nothing distinctive about them. I don't think much of your theory, Channis."

"But you've missed a few points. Didn't you notice that they never

formed coalitions? They always remained completely outside the politics of this corner of the star swarm. As you say, they conquered a few planets, but then they stopped—and that without any startling defeat of consequence. It's just as if they spread out enough to protect themselves, but not enough to attract attention."

"Very well," came the unemotional response. "I have no objection to landing. At the worst—a little lost time."

"Oh, no. At the worst—complete defeat. If it *is* the Second Foundation. Remember it would be a world of space-knows-how-many Mules."

"What do you plan to do?"

"Land on some minor subject planet. Find out as much as we can about Tazenda first, then improvise from that."

"All right. No objection. If you don't mind now, I *would* like the light out."

Channis left with a wave of his hand.

And in the darkness of a tiny room in an island of driving metal lost in the vastness of space, General Han Pritcher remained awake, following the thoughts that led him through such fantastic reaches.

If everything he had so painfully decided were true—and how all the facts were beginning to fit—then Tazenda *was* the Second Foundation. There was no way out. But how? How?

Could it be Tazenda? An ordinary world? One without distinction? A slum lost amid the wreckage of an Empire? A splinter among the fragments? He remembered, as from a distance, the Mule's shriveled face and his thin voice as he used to speak of the old Foundation psychologist, Ebling Mis, the one man who had—maybe—learned the secret of the Second Foundation.

Pritcher recalled the tension of the Mule's words: "It was as if astonishment had overwhelmed Mis. It was as though something about the Second Foundation had surpassed all his expectations, had driven in a direction completely different from what he might have assumed. If I could only have read his thoughts rather than his emotions. Yet the emotions were plain—and above everything else was this vast surprise."

Surprise was the keynote. Something supremely astonishing! And now came this boy, this grinning youngster, glibly joyful about Tazenda and its undistinguished subnormality. And he had to be right. He *had* to. Otherwise, nothing made sense.

Pritcher's last conscious thought had a touch of grimness. That hypertracer along the Etheric tube was still there. He had checked it one hour back, with Channis well out of the way.

INTERLUDE

It was a casual meeting in the anteroom of the Council Chamber—just a few moments before passing into the Chamber to take up the business of the day—and the few

thoughts flashed back and forth quickly.

"So the Mule is on his way."

"That's what I hear, too. Risky! Mighty risky!"

"Not if affairs adhere to the functions set up."

"The Mule is not an ordinary man—and it is difficult to manipulate his chosen instruments without detection by him. The controlled minds are difficult to touch. They say he's caught on to a few cases."

"Yes, I don't see how that can be avoided."

"Uncontrolled minds are easier. But so few are in positions of authority under him—"

They entered the Chamber. Others of the Second Foundation followed them.

III.

Rossem is one of those marginal worlds usually neglected in Galactic history and scarcely ever obtruding itself upon the notice of men of the myriad happier planets.

In the latter days of the Galactic Empire, a few political prisoners had inhabited its wastes, while an observatory and a small Naval garrison served to keep it from complete desertion. Later, in the evil days of strife, even before the time of Hari Seldon, the weaker sort of men, tired of the periodic decades of insecurity and danger; weary of sacked planets and a ghostly succession of ephemeral emperors making their way to the Purple for a few wicked, fruitless years—these men fled the populated centers and sought shelter in the barren nooks of the Galaxy.

Along the chilly wastes of Rossem, villages huddled. Its sun was a small ruddy niggard that clutched its dribble of heat to itself, while snow beat thinly down for nine months of the year. The tough native grain lay dormant in the soil those snow-filled months, then grew and ripened in almost panic speed, when the sun's reluctant radiation brought the temperature to nearly fifty.

Small, goatlike animals cropped the grasslands, kicking the thin snow aside with tiny, tri-hooved feet.

The men of Rossem had, thus, their bread and their milk—and when they could spare an animal—even their meat. The darkly ominous forests that gnarled their way over half of the equatorial region of the planet supplied a tough, fine-grained wood for housing. This wood, together with certain furs and minerals, was even worth exporting, and the ships of the Empire came at times and brought in exchange farm machinery, atomic heaters, even televisor sets. The last was not really incongruous, for the long winter imposed a lonely hibernation upon the peasant.

Imperial history flowed past the peasants of Rossem. The trading ships might bring news in impatient spurts; occasionally new fugitives would arrive—at one time, a relatively large group arrived in a body and remained—and these usually had news of the Galaxy.

It was then that the Rossemites

learned of sweeping battles and decimated populations or of tyrannical emperors and rebellious viceroys. And they would sigh and shake their heads, and draw their fur collars closer about their bearded faces as they sat about the village square in the weak sun and philosophized on the evil of men.

Then after a while, no trading ships arrived at all, and life grew harder. Supplies of foreign, soft food, of tobacco, of machinery stopped. Vague word from scraps gathered on the televisor brought increasingly disturbing news. And finally it spread that Trantor had been sacked. The great capital world of all the Galaxy, the splendid, storied, unapproachable and incomparable home of the emperors had been despoiled and ruined and brought to utter destruction.

It was something inconceivable, and to many of the peasants of Rossem, scratching away at their fields, it might well seem that the end of the Galaxy was at hand.

•

And then one day not unlike other days a ship arrived again. The old men of each village nodded wisely

and lifted their old eyelids to whisper that thus it had been in their father's time—but it wasn't, quite.

This ship was not an Imperial ship. The glowing Spaceship-and-Sun of the Empire was missing from its prow. It was a stubby affair made of scraps of older ships—and the men within called themselves soldiers of Tazenda.

The peasants were confused. They had not heard of Tazenda, but they greeted the soldiers nevertheless in the traditional fashion of hospitality. The newcomers inquired closely as to the nature of the planet, the number of its inhabitants, the number of its cities—a word mistaken by the peasants to mean "villages" to the confusion of all concerned—its type of economy and so on.

Other ships came and proclamations were issued all over the world that Tazenda was now the ruling world. that tax-collecting stations would be established girdling the equator—the inhabited region—that percentages of grain and furs according to certain numerical formulae would be collected annually.

The Rossemites had blinked solemnly, uncertain of the word "taxes." When collection time came, many had paid, or had stood by in confusion while the uniformed, other-worldlings loaded the harvested corn and the pelts on to the broad ground-cars.

Here and there indignant peasants banded together and brought out ancient hunting weapons—but of this nothing ever came. Grumblingly they had disbanded when the men of Tazenda came and with dismay watched their hard struggle for existence become harder.

But a new equilibrium was reached. The Tazendian governor lived dourly in the village of Gentri, from which all Rossemites were barred. He and the officials under him were dim other-world beings that rarely impinged on the Rossemite ken. The tax-farmers, Rossemites in the employ of Tazenda, came periodically, but they were creatures of custom now—and the peasant had learned how to hide his grain and drive his cattle into the forest, and refrain from having his hut appear too ostentatiously prosperous. Then with a dull, uncomprehending expression he would greet all sharp questioning as to his assets by merely pointing at what they could see.

Even that grew less, and taxes decreased, almost as if Tazenda wearied of extorting pennies from such a world.

Trading sprang up and perhaps Tazenda found that more profitable. The men of Rossem no longer received in exchange the polished creations of the Empire, but even Tazendian machines and Tazendian food was better than the native stuff. And there were clothes for the women of other than gray homespun, which was a very important thing.

So once again, Galactic history glided past peacefully enough, and the peasants scrabbled life out of the hard soil.

Narovi blew into his beard as he stepped out of his cottage. The first snows were sifting across the hard ground and the sky was a dull, overcast pink. He squinted carefully upward and decided that no real storm was in sight. He could travel to Gentri without much trouble and get rid of his surplus grain in return for enough canned foods to last the winter.

He roared back through the door, which he opened a crack for the purpose: "Has the car been fed its fuel, yunker?"

A voice shouted from within, and then Narovi's oldest son, his short, red beard not yet completely outgrown its boyish sparseness, joined him.

"The car," he said, sullenly, "is fueled and rides well, but for the bad condition of the axles. For that I am of no blame. I have told you it needs expert repairs."

The old man stepped back and surveyed his son through lowering eyebrows, then thrust his hairy chin outward: "And is the fault mine? Where and in what manner may I achieve expert repairs? Has the harvest then been anything but scanty for five years? Have my herds escaped the pest? Have the pelts climbed of themselves—"

"Narovi!" The well-known voice from within stopped him in midword. He grumbled, "Well, well—and now your mother must insert herself into the affairs of a father and his son. Bring out the car, and see to it that the storage trailers are securely attached."

He pounded his gloved hands together, and looked upward again. The dimly-ruddy clouds were gathering and the gray sky that showed in the rifts bore no warmth. The sun was hidden.

He was at the point of looking away, when his dropping eyes caught and his finger almost automatically rose on high while his mouth fell open in a shout, in complete disregard of the cold air.

"Wife," he called vigorously, "Old woman— come here."

An indignant head appeared at a window. The woman's eyes followed his finger, gaped. With a cry, she dashed down the wooden stairs, snatching up an old wrap and a square of linen as she went. She emerged with the linen wrapped insecurely over her head and ears, and the wrap dangling from her shoulders.

She snuffled: "It is a ship from outer space."

And Narovi remarked impatiently: "And what else could it be? We have visitors, old woman, visitors!"

The ship was sinking slowly to a landing on the bare frozen field in the northern portions of Narovi's farm.

"But what shall we do?" gasped the woman. "Can we offer these people hospitality? Is the dirt floor of our hovel to be theirs and the pickings of last week's hoecake?"

"Shall they then go to our neighbors?" Narovi purpled past the crimson induced by the cold and his arms in their sleek fur covering lunged out and seized the woman's brawny shoulders.

"Wife of my soul," he purred,

"you will take the two chairs from our room downstairs; you will see that a fat youngling is slaughtered and roasted with tubers; you will bake a fresh hoecake. I go now to greet these men of power from outer space . . . and . . . and—" He paused, placed his great cap awry, and scratched hesitantly. "Yes, I shall bring my jug of brewed grain as well. Hearty drink is pleasant."

The woman's mouth had flapped idly during this speech. Nothing came out. And when that stage passed, it was only a discordant screech that issued.

Narovi lifted a finger, "Old woman, what was it the village Elders said a se'nnight since? Eh? Stir your memory. The Elders went from farm to farm—themselves! Imagine the importance of it!—to ask us that should any ships from outer space land, they were to be informed immediately *on the orders of the governor.*

"And now shall I not seize the opportunity to win into the good graces of those in power? Regard that ship. Have you ever seen its like? These men from the outer worlds are rich, great. The governor himself sends such urgent messages concerning them that the Elders walk from farm to farm in the cooling weather. Perhaps the message is sent throughout all Rossem that these men are greatly desired by the Lords of Tazenda—and it is on *my* farm that they are landing."

He fairly hopped for anxiety, "The proper hospitality now—the mention of my name to the governor—and what may not be ours?"

His wife was suddenly aware of the cold biting through her thin house-clothing. She leaped towards the door, shouting over her shoulders, "Leave then quickly."

But she was speaking to a man who was even then racing towards the segment of the horizon against which the ship sank.

Neither the cold of the world, nor its bleak, empty spaces worried General Han Pritcher. Nor the poverty of their surroundings, nor the perspiring peasant himself.

What did bother him was the question of the wisdom of their tactics? He and Channis were alone here.

The ship, left in space, could take care of itself in ordinary circumstances, but still, he felt unsafe. It was Channis, of course, who was responsible for this move. He looked across at the young man and caught him winking cheerfully at the gap in the furred partition, in which a woman's peeping eyes and gaping mouth momentarily appeared.

Channis, at least, seemed completely at ease. That fact Pritcher savored with a vinegary satisfaction. His game had not much longer to proceed exactly as he wished it. Yet, meanwhile their wrist ultrawave sender-receivers were their only connection with the ship.

And then the peasant host smiled enormously and bobbed his head several times and said in a voice oily with respect, "Noble Lords, I crave

leave to tell you that my eldest son —a good, worthy lad whom my poverty prevents from educating as his wisdom deserves—has informed me that the Elders will arrive soon. I trust your stay here has been as pleasant as my humble means—for I am poverty-stricken, though a hard-working, honest, and humble farmer, as anyone here will tell you —could afford."

"Elders?" said Channis, lightly. "The chief men of the region here?"

"So they are, Noble Lords, and honest, worthy men all of them, for our entire village is known throughout Rossem as a just and righteous spot—though living is hard and the returns of the fields and forests meager. Perhaps you will mention to the Elders, Noble Lords, of my respect and honor for travelers and it may happen that they will request a new motor wagon for our household as the old one can scarcely creep and upon the remnant of it depends our livelihood."

He looked humbly eager and Han Pritcher nodded with the properly aloof condescension required of the role of "Noble Lords" bestowed upon them,

"A report of your hospitality shall reach the ears of your Elders."

Pritcher seized the next moments of isolation to speak to the apparently half-sleeping Channis.

"I am not particularly fond of this meeting of the Elders," he said. "Have you any thoughts on the subject?"

Channis seemed surprised. "No. What worries you?"

"It seems we have better things to do than to become conspicuous here."

Channis spoke hastily, in a low monotoned voice: "It may be necessary to risk becoming conspicuous in our next moves. We won't find the type of men we want, Pritcher, by simply reaching out a hand into a dark bag and groping. Men who rule by tricks of the mind need not necessarily be men in obvious power. In the first place, the psychologists of the Second Foundation are probably a very small minority of the total population, just as on your own First Foundation, the technicians and scientists formed a minority. The ordinary inhabitants are probably just that—very ordinary. The psychologists may even be well hidden, and the men in the apparently ruling position, may honestly think they are the true masters. Our solution to that problem may be found here on this frozen lump of a planet."

"I don't follow that at all."

"Why, see here, it's obvious enough. Tazenda is probably a huge world of millions or hundreds of millions. How could we identify the psychologists among them and be able to report truly to the Mule that we have located the Second Foundation? But here, on this tiny peasant world and subject planet, all the Tazendian rulers, our host informs us, are concentrated in their chief village of Gentri. There may be only a few hundred of them there, Pritcher, and among them *must* be one or more of the men of the Second Foundation. We will go there eventually, but let us see the

Elders first—it's a logical step on the way."

They drew apart easily, as their black-bearded host tumbled into the room again, obviously agitated.

"Noble Lords, the Elders are arriving. I crave leave to beg you once more to mention a word, perhaps, on my behalf—" He almost bent double in a paroxysm of fawning.

"We shall certainly remember you," said Channis. "Are these your Elders?"

They apparently were. There were three.

One approached. He bowed with a dignified respect and said: "We are honored. Transportation has been provided, Respected sirs, and we hope for the pleasure of your company at our Meeting Hall."

INTERLUDE

The First Speaker gazed wistfully at the night sky. Wispy clouds skudded across the faint stargleams. Space looked actively hostile. It was cold and awful at best but now it contained that strange creature, the Mule, and the very content seemed to darken and thicken it into ominous threat.

The meeting was over. It had not been long. There had been the doubts and questionings inspired by the difficult mathematical problem of dealing with a mental mutant of uncertain makeup. All the extreme permutations had had to be considered.

Were they even yet certain? Somewhere in this region of space—within reaching distance as Galactic spaces go—was the Mule. What would he do?

It was easy enough to handle his men. They reacted—and were reacting—according to plan.

But what of the Mule himself?

IV.

The Elders of this particular region of Rossem were not exactly what one might have expected. They were not a mere extrapolation of the peasantry; older, more authoritative, less friendly.

Not at all.

The dignity that had marked them at first meeting had grown in impression till it had reached the mark of being their predominant characteristic.

They sat about their oval table like so many grave and slow-moving thinkers. Most were a trifle past their physical prime, though the few who possessed beards wore them short and neatly arranged. Still, enough appeared younger than forty to make it quite obvious that "Elders" was a term of respect rather than entirely a literal description of age.

The two from outer space were at the head of the table and in the solemn silence that accompanied a rather frugal meal that seemed ceremonious rather than nourishing, absorbed the new, contrasting atmosphere.

After the meal and after one or two respectful remarks—too short and simple to be called speeches—had been made by those of the

Elders apparently held most in esteem, an informality forced itself upon the assembly.

It was as if the dignity of greeting foreign personages had finally given way to the amiable rustic qualities of curiosity and friendliness.

They crowded around the two strangers and the flood of questions came.

They asked if it were difficult to handle a spaceship, how many men were required for the job, if better motors could be made for their ground-cars, if it was true that it rarely snowed on other worlds as was said to be the case with Tazenda, how many people lived on their world, if it was as large as Tazenda, if it was far away, how their clothes were woven and what gave them the metallic shimmer, why they did not wear furs, if they shaved every day, what sort of stone that was in Pritcher's ring— The list stretched out.

And almost always the questions were addressed to Pritcher as though, as the elder, they automatically invested him with the greater authority. Pritcher found himself forced to answer at greater and greater length. It was like an immersion in a crowd of children. Their questions were those of utter and disarming wonder. Their eagerness to know was completely irresistible and would not be denied.

Pritcher explained that spaceships were not difficult to handle and that crews varied with the size, from one to many, that the motors of their ground-cars were unknown in detail to him but could doubtless be improved, that the climates of worlds varied almost infinitely, that many hundreds of millions lived on his world but that it was far smaller and more insignificant than the great empire of Tazenda, that their clothes were woven of silicone plastics in which metallic luster was artificially produced by proper orientation of the surface molecules, and that they could be artificially heated so that furs were unnecessary, that they shaved every day, that the stone in his ring was an amethyst. The list stretched out. He found himself thawing to these naive provincials against his will.

And always as he answered there was a rapid chatter among the Elders, as though they debated the information gained. It was difficult to follow these inner discussions of theirs for they lapsed into their own accented version of the universal Galactic language that, through long separation from the currents of living speech, had become archaic.

Almost, one might say, their curt comments among themselves hovered on the edge of understanding, but just managed to elude the clutching tendrils of comprehension.

Until finally Channis interrupted to say, "Good sirs, you must answer us for a while, for we are strangers and would be very much interested to know all we can of Tazenda."

And what happened then was that a great silence fell and each of the hitherto voluble Elders grew silent. Their hands, which had been moving in such rapid and delicate accompaniment to their words as

though to give them greater scope and varied shades of meaning, fell suddenly limp. They stared furtively at one another, apparently quite willing each to let the other have all the floor.

Pritcher interposed quickly, "My companion asks this in friendliness, for the fame of Tazenda fills the Galaxy and we, of course, shall inform the governor of the loyalty and love of the Elders of Rossem."

No sigh of relief was heard but faces brightened. An Elder stroked his beard with thumb and forefinger, straightening its slight curl with a gentle pressure, and said: "We are faithful servants of the Lords of Tazenda."

Pritcher's annoyance at Channis' bald question subsided. It was apparent, at least, that the age that he had felt creeping over him of late had not yet deprived him of his own capacity for making smooth the blunders of others.

He continued: "We do not know, in our far part of the universe, much of the past history of the Lords of Tazenda. We presume they have ruled benevolently here for a long time."

The same Elder who spoke before, answered. In a soft, automatic way he had become spokesman. He said: "Not the grandfather of the oldest can recall a time in which the Lords were absent."

"It has been a time of peace?"

"It has been a time of peace!" He hesitated. "The governor is a strong and powerful Lord who would not hesitate to punish traitors. None of us are traitors, of course."

"He has punished some in the past, I imagine, as they deserve."

Again hesitation, "None here have ever been traitors, or our fathers or our fathers' fathers. But on other worlds, there have been such, and death followed for them quickly. It is not good to think of for we are humble men who are poor farmers and not concerned with matters of politics."

The anxiety in his voice, the universal concern in the eyes of all of them was obvious.

Pritcher said smoothly: "Could you inform us as to how we can arrange an audience with your governor."

And instantly an element of sudden bewilderment entered the situation.

For after a long moment, the elder said: "Why, did you not know? The governor will be here tomorrow. He has expected you. It has been a great honor for us. We . . . we hope earnestly that you will report to him satisfactorily as to our loyalty to him."

Pritcher's smile scarcely twitched. "Expected us?"

The Elder looked wonderingly from one to the other. "Why . . . it is now a week since we have been waiting for you."

Their quarters were undoubtedly luxurious for the world. Pritcher had lived in worse. Channis showed nothing but indifference to externals.

But there was an element of ten-

sion between them of a different nature than hitherto. Pritcher felt the time approaching for a definite decision and yet there was still the desirability of additional waiting. To see the governor first would be to increase the gamble to dangerous dimensions and yet to win that gamble might multi-double the winnings. He felt a surge of anger at the slight crease between Channis' eyebrows, the delicate uncertainty with which the young man's lower lip presented itself to an upper tooth. He detested the useless play-acting and yearned for an end to it.

He said: "We seem to be anticipated."

"Yes," said Channis, simply.

"Just that? You have no contribution of greater pith to make. We come here and find that the governor expects us. Presumably we shall find from the governor that Tazenda itself expects us. Of what value then is our entire mission?"

Channis looked up, without endeavoring to conceal the weary note in his voice: "To expect us is one thing; to know who we are and what we came for, is another."

"Do you expect to conceal these things from men of the Second Foundation?"

"Perhaps. Why not? Are you ready to throw your hand in? Suppose our ship was detected in space. Is it unusual for a realm to maintain frontier observation posts? Even if we were ordinary strangers, we would be of interest."

"Sufficient interest for a governor to come to us rather than the reverse?"

Channis shrugged: "We'll have to meet that problem later. Let us see what this governor is like."

Pritcher bared his teeth in a bloodless kind of scowl. The situation was becoming ridiculous.

Channis proceeded with an artificial animation: "At least we know one thing. Tazenda is the Second Foundation or a million shreds of evidence are unanimously pointing the wrong way. How do you interpret the obvious terror in which these natives hold Tazenda? I see no signs of political domination. Their groups of Elders apparently meet freely and without interference of any sort. The taxation they speak of doesn't seem at all extensive to me or efficiently carried through. The natives speak much of poverty but seem sturdy and well-fed. The houses are uncouth and their villages rude, but are obviously adequate for the purpose.

"In fact, the world fascinates me. I have never seen a more forbidding one, yet I am convinced there is no suffering among the population and that their uncomplicated lives manage to contain a well-balanced happiness lacking in the sophisticated populations of the advanced centers."

"Are you an admirer of peasant virtues, then?"

"The stars forbid." Channis seemed amused at the idea. "I merely point out the significance of all this. Apparently, Tazenda is an efficient administrator—efficient in a sense far different from the efficiency of the old Empire or of the First Foundation, or even of our

own Union. All these have brought mechanical efficiency to their subjects at the cost of more intangible values. Tazenda brings happiness and sufficiency. Don't you see that the whole orientation of their domination is different? It is not physical, but psychological."

"Really?" Pritcher allowed himself irony. "And the terror with which the Elders spoke of the punishment of treason by these kind-hearted psychologist administrators? How does that suit your thesis?"

"Were they the objects of the punishment? They speak of punishment only of others. It is as if knowledge of punishment has been so well implanted in them that punishment itself need never be used. The proper mental attitudes are so inserted into their minds that I am certain that not a Tazendian soldier exists on the planet. Don't you *see* all this?"

"I'll see perhaps," said Pritcher, coldly, "when I see the governor. And what, by the way, if *our* mentalities are handled?"

Channis replied with brutal contempt: *"You* should be accustomed to *that."*

Pritcher whitened perceptibly, and, with an effort, turned away. They spoke to one another no more that day.

It was in the silent windlessness of the frigid night, as he listened to the soft, sleeping motions of the other, that Pritcher silently adjusted his wrist-transmitter to the ultra-wave region for which Channis' was unadjustable and, with noiseless touches of his fingernail, contacted the ship.

The answer came in little periods of noiseless vibration that barely lifted themselves above the sensory threshold.

Twice Pritcher asked: "Any communications at all yet?"

Twice the answer came: "None. We wait always."

He got out of bed. It was cold in the room and he pulled the furry blanket around him as he sat in the chair and stared out at the crowding stars so different in the brightness and complexity of their arrangement from the even fog of the Galactic Lens that dominated the night sky of his native Periphery.

Somewhere there between the stars was the answer to the complications that overwhelmed him, and he felt the yearning for that solution to arrive and end things.

For a moment he wondered again if the Mule were right—if Conversion had robbed him of the firm sharp edge of self-reliance. Or was it simply age and the fluctuations of these last years?

He didn't really care.

He was tired.

The governor of Rossem arrived with minor ostentation. His only companion was the uniformed man at the controls of the ground-car.

The ground-car itself was of lush design but to Pritcher it appeared inefficient. It turned clumsily; more than once it apparently

balked at what might have been a too-rapid change of gears. It was obvious at once from its design that it ran on chemical, and not on atomic, fuel.

The Tazendian governor stepped softly on to the thin layer of snow and advanced between two lines of respectful Elders. He did not look at them but entered quickly. They followed after him.

From the quarters assigned to them, the two men of the Mule's Union watched. He—the governor—was thickset, rather stocky, short, unimpressive.

But what of that?

Pritcher cursed himself for a failure of nerve. His face, to be sure, remained icily calm. There was no humiliation before Channis—but he knew very well that his blood pressure had heightened and his throat had become dry.

It was not a case of physical fear. He was not one of those dull-witted, unimaginative men of nerveless meat who were too stupid ever to be afraid—but physical fear he could account for and discount.

But this was different. It was the other fear.

He glanced quickly at Channis. The young man glanced idly at the nails of one hand and poked leisurely at some trifling unevenness.

Something inside Pritcher became vastly indignant. What had Channis to fear of mental handling?

Pritcher caught a mental breath and tried to think back. How had he been before the Mule had converted him from the die-hard Democrat that he was. It was hard to remember. He could not place himself mentally. He could not break the clinging wires that bound him emotionally to the Mule. Intellectually, he could remember that he had once tried to assassinate the Mule but not for all the straining he could endure, could he remember his emotions at the time. That might be the self-defense of his own mind, however, for at the intuitive thought of what those emotions might have been—not realizing the details, but merely comprehending the drift of it—his stomach grew queazy.

What if the governor tampered with his mind?

What if the insubstantial mental tendrils of a Second Foundationer insinuated itself down the emotional crevices of his makeup and pulled them apart and rejoined them—

There had been no sensation the first time. There had been no pain, no mental jar—not even a feeling of discontinuity. He had always loved the Mule. If there had ever been a time long before—as long before as five short years—when he had thought he hadn't loved him, that he had hated him—that was just a horrid illusion. The thought of that illusion embarrassed him.

But there had been no pain.

Would meeting the governor duplicate that? Would all that had gone before—all his service for the Mule—all his life's orientation—join the hazy, other-

life dream that held the word, Democracy. The Mule also a dream, and only to Tazenda, his loyalty—

Sharply, he turned away.

There was that strong desire to retch.

And then Channis' voice clashed on his ear, "I think this is it, general."

Pritcher turned again. An Elder had opened the door silently and stood with a dignified and calm respect upon the threshold.

He said, "His Excellency, Governor of Rossem, in the name of the Lords of Tazenda, is pleased to present his permission for an audience and request your appearance before him."

"Sure thing," and Channis tightened his belt with a jerk and adjusted a Rossemian hood over his head.

Pritcher's jaw set. *This* was the beginning of the real gamble.

The governor of Rossem was not of formidable appearance. For one thing, he was bareheaded, and his thinning hair, light brown, tending to gray, lent him mildness. His bony eye-ridges lowered at them, and his eyes, set in a fine network of surrounding wrinkles, seemed calculating, but his fresh-cropped chin was soft and small and, by the universal convention of followers of the pseudoscience of reading character by facial bony structure, seemed "weak."

Pritcher avoided the eyes and watched the chin. He didn't know whether that would be effective—if anything would be.

The governor's voice was high-pitched, indifferent: "Welcome to Tazenda. We greet you in peace. You have eaten?"

His hand—long fingers, gnarled veins—waved almost regally at the U-shaped table.

They bowed and sat down. The governor sat the outer side of the base of the U, they on the inner; along both arms sat the double row of silent Elders.

The governor spoke in short, abrupt sentences—praising the food as Tazendian importations—and it had indeed a quality different if, somehow, not so much better, than the rougher food of the Elders—disparaging Rossemian weather, referring with an attempt at casualness to the intricacies of space travel.

Channis talked little. Pritcher not at all.

Then it was over. The small, stewed fruits were finished; the napkins used and discarded, and the governor leaned back.

His small eyes sparkled.

"I have inquired as to your ship. Naturally, I would like to see that it receives due care and overhaul. I am told its whereabouts is unknown."

"True," Channis replied lightly. "We have left it in space. It is a large ship, suitable for long journeys in sometimes hostile regions, and we felt that landing it here might give rise to doubts as to our peaceful intentions. We preferred to land alone, unarmed."

"A friendly act," commented the governor, without conviction. "A large ship, you say?"

"Not a vessel of war, excellency."

"Ha, hum. Where is it you come from?"

"A small world of the Santanni sector, your excellency. It may be you are not aware of its existence for it lacks importance. We are interested in establishing trade relationships."

"Trade, eh? And what have you to sell?"

"Machines of all sorts, excellency. In return, food, wood, ores—"

"Ha, hum." The governor seemed doubtful. "I know little of these matters. Perhaps mutual profit may be arranged. Perhaps, after I have examined your credentials at length -for much information will be required by my government before matters may proceed, you understand—and after I have looked over your ship, it would be advisable for you to proceed to Tazenda."

There was no answer to that, and the governor's attitude iced perceptibly.

"It is necessary that I see your ship, however."

Channis said distantly: "The ship, unfortunately, is undergoing repairs at the moment. If your excellency would not object to giving us forty-eight hours, it will be at your service."

"I am not accustomed to waiting."

For the first time, Pritcher met the glare of the other, eye to eye, and his breath exploded softly inside him. For a moment, he had the sensation of drowning, but then his eyes tore away.

Channis did not waver. He said: "The ship cannot be landed for forty-eight hours, excellency. We are here and unarmed. Can you doubt our honest intentions?"

There was a long silence, and then the governor said gruffly: "Tell me of the world from which you come."

That was all. It passed with that. There was no more unpleasantness. The governor, having fulfilled his official duty, apparently lost interest and the audience died a dull death.

And when it was *all* over, Pritcher found himself back in their quarters and took stock of himself.

Carefully -holding his breath—he "felt" his emotions. Certainly he seemed no different to himself, but *would* he feel any difference? Had he felt different after the Mule's Conversion? Had not everything seemed natural? As it should have been?

He experimented.

With cold purpose, he shouted inside the silent caverns of his mind, and the shout was, "The Second Foundation must be discovered and destroyed."

And the emotion that accompanied it was honest hate. There was not as much as a hesitation involved in it.

And then it was in his mind to substitute the word "Mule" for the phrase "Second Foundation" and

his breath caught at the mere emotion and his tongue clogged.

So far, good.

But had he been handled otherwise—more subtly? Had tiny changes been made? Changes that he couldn't detect because their very existence warped his judgment.

There was no way to tell.

But he still felt absolute loyalty to the Mule! If that were unchanged, nothing else really mattered.

He turned his mind to action again. Channis was busy at his end of the room. Pritcher's thumbnail idled at his wrist communicator.

And then at the response that came he felt a wave of relief surge over him and leave him weak.

The quiet muscles of his face did not betray him, but inside he was shouting with joy—and when Channis turned to face him, he knew that the farce was about over.

INTERLUDE

The two Speakers passed each other on the road and one stopped the other.

"I have word from the First Speaker."

There was a half-apprehensive flicker in the other's eyes. "Intersection point?"

"Yes! May we live to see the dawn!"

V.

There was no sign in any of Channis' actions that he was aware of any subtle change in the attitude of Pritcher and in their

CHANNIS

relations to each other. He leaned back on the hard wooden bench and spread-eagled his feet out in front of him.

"What did you make of the governor?"

Pritcher shrugged: "Nothing at all. He certainly seemed no mental genius to me. A very poor specimen of the Second Foundation, if that's what he was supposed to be."

"I don't think he was, you know. I'm not sure what to make of it. Suppose you were a Second Foundationer," Channis grew thoughtful, "what would *you* do? Suppose you had an idea of our purpose here. How would you handle us?"

"Conversion, of course."

"Like the Mule?" Channis looked up, sharply. "Would we know if they *had* converted us? I wonder—And what if they were simply psychologists, but very clever ones."

"In that case, I'd have us killed rather quickly."

"And our ship? No." Channis wagged a forefinger. "We're playing a bluff, Pritcher, old man. It can only be a bluff. Even if they have emotional control down pat, we—you and I—are only fronts. It's the Mule they must fight, and they're being just as careful of us as we are of them. I'm assuming that they know who we are."

Pritcher stared coldly: "What do you intend doing?"

"Wait." The word was bitten off. "Let them come to us. They're worried, maybe about the ship, but probably about the Mule. They bluffed with the governor. It didn't work. We stayed pat. The next person they'll send *will* be a Second Foundationer, and he'll propose a deal of some sort."

"And then?"

"And then we make the deal."

"I don't think so."

"Because you think it will double-cross the Mule? It won't."

"No, the Mule could handle your double-crosses, any you could invent. But I still don't think so."

"Because you think then we couldn't double-cross the Foundationers?"

"Perhaps not. But that's not the reason."

Channis let his glance drop to what the other held in his fist, and said grimly: "You mean *that's* the reason."

Pritcher cradled his blaster, "That's right. You are under arrest."

"Why?"

"For treason to the First Citizen of the Union."

Channis' lips hardened upon one another: "What's going on?"

"Treason! As I said. And correction of the matter, on my part."

"Your proof? Or evidence, assumptions, daydreams? Are you mad?"

"No. Are you? Do you think the Mule sends out unweaned youngsters on ridiculous swashbuckling missions for nothing? It was queer to me at the time. But I wasted time in doubting myself. Why should he send *you?* Because

you smile and dress well? Because you're twenty-eight."

"Perhaps because I can be trusted. Or aren't you in the market for logical reasons?"

"Or perhaps because you can't be trusted. Which is logical enough, as it turns out."

"Are we matching paradoxes, or is this all a word game to see who can say the least in the most words?"

And the blaster advanced, with Pritcher after it. He stood erect before the younger man: "Stand up!"

Channis did so, in no particular hurry, and felt the muzzle of the blaster touch his belt with no shrinking of the stomach muscles.

Pritcher said: "What the Mule wanted was to find the Second Foundation. He had failed and I had failed, and the secret that neither of us can find is a well-hidden one. So there was one outstanding possibility left—and that was to find a seeker who already knew the hiding-place."

"Is that I?"

"Apparently it was. I didn't know then, of course, but though my mind must be slowing, it still points in the right direction. How easily we found Star's End! How miraculously you examined the correct Field Region of the Lens from among an infinite number of possibilities! And having done so, how nicely we observe just the correct point for observation! You clumsy fool! Did you so underestimate me that no combination of impossible fortuities struck you as being too much for me to swallow?"

"You mean I've been too successful?"

"Too successful by half for any loyal man."

"Because the standards of success you set me were so low?"

And the blaster prodded, though in the face that confronted Channis only the cold glitter of the eyes betrayed the growing anger: "Because you are in the pay of the Second Foundation."

"Pay?" — infinite contempt. "Prove that."

"Or under the mental influence."

"Without the Mule's knowledge? Ridiculous."

"*With* the Mule's knowledge. Exactly my point, my young dullard. *With* the Mule's knowledge. Do you suppose else that you would be given a ship to play with? You led us to the Second Foundation as you were supposed to do."

"I thresh a kernel of something or other out of this immensity of chaff. May I ask why I'm supposed to be doing all this? If I were a traitor, why should I lead you to the Second Foundation? Why not hither and yon through the Galaxy, skipping gaily, finding no more than you ever did?"

"For the sake of the ship. And because the men of the Second Foundation quite obviously need atomic warfare for self-defense."

"You'll have to do better than that. One ship won't mean anything to them, and if they think they'll learn science from it and

build atomic power plants next year, they are very, very simple Second Foundationers, indeed. On the order of simplicity as yourself, I should say."

"You will have the opportunity to explain that to the Mule."

"We're going back to Kalgan?"

"On the contrary. We're staying here. And the Mule will join us in fifteen minutes—more or less. Do you think he hasn't followed us, my sharp-witted, nimble-minded lump of self-admiration? You have played the decoy well in reverse. You may not have led our victims to us, but you have certainly led us to our victims."

"May I sit down," said Channis, "and explain something to you in picture drawings? Please."

"You will remain standing."

"At that, I can say it as well standing. You think the Mule followed us because of the hyper-tracer on the communication circuit?"

The blaster might have wavered. Channis wouldn't have sworn to it. He said: "You don't look surprised. But I don't waste time doubting that you feel surprised. Yes, I knew about it. And now, having shown you that I knew of something you didn't think I did, I'll tell you something *you* don't know, that I know you don't."

"You allow yourself too many preliminaries, Channis. I should think your sense of invention was more smoothly greased.

"There's no invention to this. There *have* been traitors, of course, or enemy agents, if you prefer that term. But the Mule knew of that in a rather curious way. It seems, you see, that some of his Converted men had been tampered with."

The blaster did waver that time. Unmistakably.

"I emphasize that, Pritcher. It was why he needed me. I was an Unconverted man. Didn't he emphasize to you that he needed an Unconverted? Whether he gave you the real reason or not?"

"Try something else, Channis. If I were against the Mule, I'd know it." Quietly, rapidly, Pritcher was feeling his mind. It felt the same. It felt the same. Obviously the man was lying.

"You mean you feel loyal to the Mule. Perhaps. Loyalty wasn't tampered with. Too easily detectable, the Mule said. But how do you feel mentally? Sluggish? Since you started this trip, have you always felt normal? Or have you felt strange sometimes, as though you weren't quite yourself? What are you trying to do, bore a hole through me without touching the trigger?"

Pritcher withdrew his blaster half an inch, "What are you trying to say?"

"I say that you've been tampered with. You've been handled. You didn't see the Mule install that hyper-tracer. You didn't see anyone do it. You just found it there, and assumed it was the Mule, and ever since you've been assuming he was following us. Sure, the wrist receiver you're wearing contacts the ship on a wave length mine

isn't good for. Do you think I didn't know that?" He was speaking quickly now, angrily. His cloak of indifference had dissolved into savagery. "But it's not the Mule that's coming toward us from out there. It's not the Mule."

"Who, if not?"

"Well, who do you suppose? I found that hyper-tracer, the day we left. But I didn't think it was the Mule. *He* had no reason for indirection at that point. Don't you see the nonsense of it? If I were a traitor and he knew that, I could be Converted as easily as you were, and he would have the secret of the location of the Second Foundation out of my mind without sending me half across the Galaxy. Can *you* keep a secret from the Mule? And if I *didn't* know, then I couldn't lead him to it. So why send me in either case?

"Obviously, that hyper-tracer must have been put there by an agent of the Second Foundation. *That's* who's coming towards us now. And would you have been fooled if your precious mind hadn't been tampered with? What kind of normality have you that you imagine immense folly to be wisdom. *Me* bring a ship to the Second Foundation? What would they do with a ship?

"It's *you* they want, Pritcher. You know more about the Union than anyone but the Mule, and you're not dangerous to them while he is. That's why they put the direction of search into my mind. Of course, it was completely impossible for me to find Tazenda by random searchings of the Lens. I knew that. But I knew there was the Second Foundation after us, and I knew they engineered it. Why not play their game? It was a battle of bluffs. They wanted us and I wanted their location—and space take the one that couldn't outbluff the other.

"But it's we that will lose as long as you hold that blaster on me. And it obviously isn't your idea. It's theirs. Give me the blaster, Pritcher. I know it seems wrong to you, but it isn't your mind speaking, it's the Second Foundation within you. Give me the blaster, Pritcher, and we'll face what's coming now, together."

Pritcher faced a growing confusion in horror. Plausibility! Could he be so wrong? Why this eternal doubt of himself? Why wasn't he sure? What made Channis sound so plausible?

Plausibility!

Or was it his own tortured mind fighting the invasion of the alien.

Was he split in two?

Hazily, he saw Channis standing before him, hand outstretched—and suddenly, he knew he was going to give him the blaster.

And as the muscles of his arm were on the point of contracting in the proper manner to do so, the door opened, not hastily, behind him—and he turned.

There are perhaps men in the Galaxy who can be confused for one another even by men at their peaceful leisure. Correspondingly,

there may be conditions of mind when even unlikely pairs may be mis-recognized. But the Mule rises above any combination of the two factors.

Not all Pritcher's agony of mind prevented the instantaneous mental flood of cool vigor that engulfed him.

Physically, the Mule could not dominate any situation. Nor did he dominate this one.

He was rather a ridiculous figure in his layers of clothing that thickened him past his normality without allowing him to reach normal dimensions even so. His face was muffled and the usually dominant beak covered what was left in a cold-red prominence.

Probably as a vision of rescue, no greater incongruity could exist.

He said: "Keep your blaster, Pritcher."

Then he turned to Channis, who had shrugged and seated himself: "The emotional context here seems rather confusing and considerably in conflict. What's this about someone other than myself following you?"

Pritcher intervened sharply: "Was a hyper-tracer placed upon our ship by your orders, sir?"

The Mule turned cool eyes upon him, "Certainly. Is it very likely that any organization in the Galaxy other than the Union of Worlds have access to it?"

"He said —"

"Well, he's here, general. Indirect quotation is not necessary. Have you been saying anything, Channis?"

"Yes. But mistakes apparently, sir. It has been my opinion that the tracer was put there by someone in the pay of the Second Foundation and that we had been led here for some purpose of theirs, which I was prepared to counter. I was under the further impression that the general was more or less in their hands."

"You sound as if you think so no longer."

"I'm afraid not. Or it would not have been you at the door."

"Well, then, let us thresh this out." The Mule peeled off the outer layers of padded, and electrically heated clothing. "Do you mind if I sit down as well? Now —we are safe here and perfectly free of any danger of intrusion. No native of this lump of ice will have any desire to approach this place. I assure you of that," and there was a grim earnestness about his insistence upon his powers.

Channis showed his disgust. "Why privacy? Is someone going to serve tea and bring out the dancing girls?"

"Scarcely. What was this theory of yours, young man? A Second Foundationer was tracing you with a device which no one but I have and—how did you say you found this place?"

"Apparently, sir, it seems obvious, in order to account for known facts, that certain notions have been put into my head—"

"By these same Second Foundationers?"

"No one else, I imagine."

"Then it did not occur to you

that if a Second Foundationer could force, or entice, or inveigle you into going to the Second Foundation for purposes of his own—and I assume you imagined he used methods similar to mine, though, mind you, I can implant only emotions, not ideas—it did not occur to you that if he could do that there was little necessity to put a hyper-tracer on you."

And Channis looked up sharply and met his sovereign's large eyes with sudden startle. Pritcher grunted and a visible relaxation showed itself in his shoulders.

"No," said Channis, "that hadn't occurred to me."

"Or that if they were obliged to trace you, they couldn't feel capable of directing you, and that, undirected, you could have precious little chance of finding your way here as you did. Did *that* occur to you?"

"That, neither."

"Why not? Has your intellectual level receded to a so-much-greater-than-probable degree?"

"The only answer is a question, sir. Are you joining General Pritcher in accusing me of being a traitor?"

"You have a defense in case I am?"

"Only the one I presented to the general. If I were a traitor and knew the whereabouts of the Second Foundation, you could Convert me and learn the knowledge directly. If you felt it necessary to trace me, then I hadn't the knowledge beforehand and wasn't a traitor. So I answer your paradox with another.

"Then your conclusion?"

"That I am not a traitor."

"To which I must agree, since your argument is irrefutable."

"Then may I ask you why you had us secretly followed?"

"Because to all the facts there is a third explanation. Both you and Pritcher explained some facts in your own individual ways, but not all. I—if you can spare me the time—will explain all. And in a rather short time, so there is little danger of boredom. Sit down, Pritcher, and give me your blaster. There is no danger of attack on us any longer. None from in here and none from out there. None in fact even from the Second Foundation. Thanks to you, Channis."

The room was lit in the usual Rossenian fashion of electrically heated wire. A single bulb was suspended from the ceiling and in its dim yellow glow, the three cast their individual shadows.

The Mule said: "Since I felt it necessary to trace Channis, it was obvious I expect to gain something thereby. Since he went to the Second Foundation with a startling speed and directness, we can reasonably assume that that was what I was expecting to happen. Since I did not gain the knowledge from him directly, something must have been preventing me. Those are the facts. Channis, of course, knows the answer. So do I. Do you see it, Pritcher?"

And Pritcher said doggedly: "No, sir."

"Then I'll explain. Only one kind of man can both know the location of the Second Foundation and prevent me from learning it. Channis, I'm afraid you're a Second Foundationer yourself."

And Channis' elbows rested on his knees as he leaned forward, and through stiff and angry lips said: "What is your direct evidence? Deduction has proven wrong twice today."

"There is direct evidence, too, Channis. It was easy enough. I told you that my men had been tampered with. The tamperer must have been, obviously, someone who was a) Unconverted, and b) fairly close to the center of things. The field was large but not entirely unlimited. You were too successful, Channis. People liked you too much. You got along too well. I wondered—"

"And then I summoned you to take over this expedition and it didn't set you back. I watched your emotions. It didn't bother you. You overplayed the confidence there, Channis. No man of real competence could have avoided a dash of uncertainty at a job like that. Since your mind did avoid it, it was either a foolish one or a controlled one.

"It was easy to test the alternatives. I seized your mind at a moment of relaxation and filled it with grief for an instant and then removed it. You were angry afterwards with such accomplished art that I could have sworn it was a natural reaction, but for that which went first. For when I wrenched at your emotions, for just one instant, for one tiny instant before you could catch yourself, your mind resisted. It was all I needed to know.

"No one could have resisted me, even for that tiny instant, without control similar to mine."

Channis' voice was low and bitter: "Well, then? Now what?"

"And now you die—as a Second Foundationer. Quite necessary, as I believe you realize."

And once again Channis stared into the muzzle of a blaster. A muzzle guided this time by a mind, not like Pritcher's capable of offhand twisting to suit himself, but by one as mature as his own and as resistant to force as his own.

And the period of time allotted him for a correction of events was small.

What followed thereafter is difficult to describe by one with the normal complement of senses and the normal incapacity for emotional control.

Essentially, this is what Channis realized in the tiny space of time involved in the pushing of the Mule's thumb upon the trigger contact.

The Mule's current emotional makeup was one of a hard and polished determination, unmisted by hesitation in the least. Had Channis been sufficiently interested afterward to calculate the time involved from the determination to shoot to the arrival of the disintegrating

energies, he might have realized that his leeway was about one-fifth of a second.

That was barely time.

What the Mule realized in that same tiny space of time was that the emotional potential of Channis' brain had surged suddenly upwards without his own mind feeling any impact and that, simultaneously, a flood of pure, thrilling hatred cascaded upon him from an unexpected direction.

It was that new emotional element that jerked his thumb off the contact. Nothing else could have done it, and almost together with his change of action, came complete realization of the new situation.

It was a tableau that endured far less than the significance adhering to it should require from a dramatic standpoint. There was the Mule, thumb off the blaster, staring intently upon Channis. There was Channis, taut, not quite daring to breathe yet. And there was Pritcher, convulsed in his chair; every muscle at a spasmodic breaking point; every tendon writhing in an effort to hurl forward; his face twisted at last out of schooled woodenness into an unrecognizable death mask of horrid hate; and his eyes only and entirely and supremely upon the Mule.

Only a word or two passed between Channis and the Mule—only a word or two and that utterly revealing stream of emotional consciousness that remains forever the true interplay of understanding between such as they. For the sake of our own limits, it is necessary to translate into words what went on, then, and thenceforward.

Channis said, tensely: "You're between two fires, First Citizen. You can't control two minds simultaneously, not when one of them is mine—so you have your choice. Pritcher is free of your Conversion now. I've snapped the bonds. He's the old Pritcher; the one who tried to kill you once; the one who thinks you're the enemy of all that is free and right and holy; and he's the one besides who knows that you've debased him to helpless adulation for five years. I'm holding him back now by suppressing his will, but if you kill me, that ends, and in considerably less time than you could shift your blaster or even your will—he will kill you."

The Mule quite plainly realized that. He did not move.

Channis continued: "If you turn to place him under control, to kill him, to do anything, you won't ever be quick enough to turn again to stop me."

The Mule still did not move. Only a soft sigh of realization.

"So," said Channis, "throw down the blaster, and let us be on even terms again, and you can have Pritcher back."

"I made a mistake," said the Mule, finally. "It was wrong to have a third party present when I confronted you. It introduced one variable too many. It is a mistake that must be paid for, I suppose."

He dropped the blaster carelessly, and kicked it to the other end of

the room. Simultaneously, Pritcher crumpled into profound sleep.

"He'll be normal when he awakes," said the Mule, indifferently.

The entire exchange from the time the Mule's thumb had begun pressing the trigger-contact to the time he dropped the blaster had occupied just under a second and a half of time.

But just beneath the borders of consciousness, for a time just above the borders of detection, Channis caught a fugitive emotional gleam in the Mule's mind. And it was still one of sure and confident triumph.

•

Two men, apparently relaxed and entirely at ease, poles apart physically—with every nerve that served as emotional detector quivering tensely.

The Mule, for the first time in long years, had insufficient surety of his own way. Channis knew that, though he could protect himself for the moment, it was an effort—and that the attack upon him was none such for his opponent. In a test of endurance, Channis knew he would lose.

But it was deadly to think of that. To give away to the Mule an emotional weakness would be to hand him a weapon. There was already that glimpse of something—a winner's something—in the Mule's mind.

To gain time—

Why did the others delay? Was that the source of the Mule's confidence? What did his opponent know that he didn't? The mind he watched told nothing. If only he could read ideas. And yet —

Channis braked his own mental whirling roughly. There was only that; to gain time—

Channis said: "Since it is decided, and not denied by myself after our little duel over Pritcher, that I am a Second Foundationer, suppose you tell me why I came to Tazenda."

"Oh, no," and the Mule laughed, with high-pitched confidence, "I am not Pritcher. I need make no explanations to you. You had what you thought were reasons. Whatever they were, your actions suited me, and so I inquire no further."

"Yet there must be such gaps in your conception of the story. Is Tazenda the Second Foundation you expected to find? Pritcher spoke much of your other attempt at finding it, and of your psychologist tool, Ebling Mis. He babbled a bit sometimes under my . . . uh . . . slight encouragement. Think back on Ebling Mis, First Citizen."

"Why should I?" Confidence!

Channis felt that confidence edge out into the open, as if with the passage of time, any anxiety the Mule might be having was increasingly vanishing.

He said, firmly restraining the rush of desperation: "You lack curiosity, then? Pritcher told me of Mis' vast surprise at *something*. There was his terribly drastic urging for speed, for a rapid warn-

ing of the Second Foundation? Why? Why? Ebling Mis died. The Second Foundation was not warned. And yet the Second Foundation exists."

The Mule smiled in real pleasure, and with a sudden and surprising dash of cruelty that Channis felt advance and suddenly withdraw: "But apparently the Second Foundation *was* warned. Else how and why did one Bail Channis arrive on Kalgan to handle my men and to assume the rather thankless task of outwitting me. The warning came too late, that is all."

"Then," and Channis allowed pity to drench outward from him, "you don't even know what the Second Foundation is, or anything of the deeper meaning of all that has been going on."

To gain time!

The Mule felt the other's pity, and his eyes narrowed with instant hostility. He rubbed his nose in his familiar four-fingered gesture, and snapped: "Amuse yourself, then. What *of* the Second Foundation?"

Channis spoke deliberately, in words rather than in emotional symbology. He said: "From what I have heard, it was the mystery that surrounded the Second Foundation that most puzzled Mis. Hari Seldon founded his two units so differently. The First Foundation was a splurge that in two centuries dazzled half the Galaxy. And the Second was an abyss that was dark.

"You won't understand why that was, unless you can once again feel the intellectual atmosphere of the days of the dying Empire. It was a time of absolutes, of the great final generalities, at least in thought. It was a sign of decaying culture, of course, that dams had been built against the further development of ideas. It was his revolt against these dams that made Seldon famous. It was that one last spark of youthful creation in him that lit the Empire in a sunset glow and dimly foreshadowed the rising sun of the Second Empire."

"Very dramatic. So what?"

"So he created his Foundations according to the laws of psychohistory, but who knew better than he that even those laws were relative. *He* never created a finished product. Finished products are for decadent minds. His was an evolving mechanism and the Second Foundation was the instrument of that evolution. *We*, First Citizen of your Temporary Union of Worlds, *we* are the guardians of Seldon's Plan. Only we!"

"Are you trying to talk yourself into courage," inquired the Mule, contemptuously, "or are you trying to impress me? For the Second Foundation, Seldon's Plan, the Second Empire all impresses me not the least, nor touches any spring of compassion, sympathy, responsibility, nor any other source of emotional aid you may be trying to tap in me. And in any case, poor fool, speak of the Second Foundation in the past tense, for it is destroyed."

Channis felt the emotional potential that pressed upon his mind rise in intensity as the Mule rose from his chair and approached. He fought back furiously, but something crept relentlessly on within him, battering and bending his mind back—and back.

He felt the wall behind him, and the Mule faced him, skinny arms akimbo, lips smiling terribly beneath that mountain of nose.

The Mule said: "Your game is through, Channis. The game of all of you—of all the men of what used to be the Second Foundation. Used to be! *Used to be!*

"What were you sitting here waiting for all this time, with your babble to Pritcher, when you might have struck him down and taken the blaster from him without the least effort of physical force? You were waiting for me, weren't you, waiting to greet me in a situation that would not too arouse my suspicions.

"Too bad for you that I needed no arousal. I knew you. I knew you well, Channis of the Second Foundation.

"But what are you waiting for now? You still throw words at me desperately, as though the mere sound of your voice would freeze me to my seat. And all the while you speak, something in your mind is waiting and waiting and is still waiting. But no one is coming. None of those you expect none of your allies. You are alone here, Channis, and you will remain alone. Do you know why?

"It is because your Second Foundation miscalculated me to the very dregs of the end. I knew their plan early. They thought I would follow you here and be proper meat for their cooking. You were to be a decoy indeed—a decoy for a poor, foolish weakling mutant, so hot on the trail of Empire that he would fall blindly into an obvious pit. But am I their prisoner?

"I wonder if it occurred to them that I'd scarcely be here without my fleet—against the artillery of any unit of which they are entirely and pitifully helpless? Did it occur to them that I would not pause for discussion or wait for events?

"My ships were launched against Tazenda twelve hours ago and they are quite, quite through with their mission. Tazenda is laid in ruins; its centers of population are wiped out. There was no resistance. The Second Foundation no longer exists, Channis—and I, the queer, ugly weakling, am the ruler of the Galaxy."

Channis could do nothing but shake his head feebly. "No—No—"

"Yes— Yes—" mimicked the Mule. "And if you are the last one alive, and you may be, that will not be for long either."

And then there followed a short, pregnant pause, and Channis almost howled with the sudden pain of that tearing penetration of the innermost tissues of his mind.

The Mule drew back and muttered: "Not enough. You do not pass the test after all. Your

despair is pretense. Your fear is not the broad overwhelming that adheres to the destruction of an ideal, but the puny seeping fear of personal destruction."

And the Mule's weak hand seized Channis by the throat in a puny grip that Channis was somehow unable to break.

"You are my insurance, Channis. You are my director and safeguard against any underestimation I may make." The Mule's eyes bore down upon him. Insistent—Demanding—

"Have I calculated rightly, Channis? Have I outwitted your men of the Second Foundation? Tazenda *is* destroyed, Channis, tremendously destroyed; so why is your despair pretense? Where is the reality? I must have reality and truth! Talk, Channis, talk. Have I penetrated then, not deeply enough? Does the danger still exist? *Talk, Channis.* Where have I done wrong?"

Channis felt the words drag out of his mouth. They did not come willingly. He clenched his teeth against them. He bit his tongue. He tensed every muscle of his throat.

And they came out—gasping—pulled out by force and tearing his throat and tongue and teeth on the way.

"Truth," he squeaked, "truth—"

"Yes, truth. What is left to be done?"

"Seldon founded Second Foundation here. Here, as I said. I told no lie. The psychologists arrived and took control of the native population."

"Of Tazenda?" The Mule plunged deeply into the flooding torture of the other's emotional upwellings—tearing at them brutally. "It is Tazenda I have destroyed. You know what I want. Give it to me."

"*Not* Tazenda. I *said* Second Foundationers might not be those apparently in power; Tazenda is the figurehead—" The words were almost unrecognizable, forming themselves against every atom of will of the Second Foundationer, "Rossem— Rossem— *Rossem is the world—*"

The Mule loosed his grip and Channis dropped into a huddle of pain and torture.

"And you thought to fool me?" said the Mule, softly.

"You *were* fooled." It was the last dying shred of resistance in Channis.

"But not long enough for you and yours. I am in communication with my Fleet. And after Tazenda can come Rossem. But first—"

Channis felt the excruciating darkness rise against him, and the automatic lift of his arm to his tortured eyes could not ward it off. It was a darkness that throttled, and as he felt his torn, wounded mind reeling backwards, backwards into the everlasting black—there was that final picture of the triumphant Mule—laughing matchstick—that long, fleshy nose quivering with laughter.

The sound faded away. The darkness embraced him lovingly.

It ended with a cracking sensation that was like the jagged glare of a lightning flash, and Channis came slowly to earth while sight returned painfully in blurry transmission through tear-drenched eyes.

His head ached unbearably, and it was only with a stab of agony that he could bring up a hand to it.

Obviously, he was alive. Softly, like feathers caught up in an eddy of air that had passed, his thoughts steadied and drifted to rest. He felt comfort suck in—from outside. Slowly, torturedly, he bent his neck —and relief was a sharp pang.

For the door was open; and the First Speaker stood just inside the threshold. He tried to speak, to shout, to warn—but his tongue froze and he knew that a part of the Mule's mighty mind still held him and clamped all speech within him.

He bent his neck once more. The Mule was still in the room. He was angry and hot-eyed. He laughed no longer, but his teeth were bared in a ferocious smile.

Channis felt the First Speaker's mental influence moving gently over his mind with a healing touch and then there was the numbing sensation as it came into contact with the Mule's defense for an instant of struggle and withdrew.

The Mule said gratingly, with a fury that was grotesque in his meagre body: "Then another comes to greet me." His agile mind reached its tendrils out of the room —out -out—

"You are alone," he said.

And the First Speaker interrupted with an acquiescence: "I am thoroughly alone. It is necessary that I be alone, since it was I who miscalculated your future five years ago. There would be a certain satisfaction to me in correcting that matter without aid. Unfortunately, I did not count on the strength of your Field of Emotional Repulsion that surrounded

this place. It took me long to penetrate. I congratulate you upon the skill with which it was constructed."

"Thank you for nothing," came the hostile rejoinder. "Bandy no compliments with me. Have you come to add your brain splinter to that of yonder cracked pillar of your realm?"

The First Speaker smiled: "Why, the man you call Bail Channis performed his mission well, the more so since he was not your mental equal by far. I can see, of course, that you have mistreated him, yet it may be that we may restore him fully even yet. He is a brave man, sir. He volunteered for this mission although we were able to predict mathematically the huge chance of damage to his mind—a more fearful alternative than that of mere physical crippling."

Channis' mind pulsed futilely with what he wanted to say and couldn't; the warning he wished to shout and was unable to. He could only emit that continuous stream of fear—fear—

The Mule was calm. "You know, of course, of the destruction of Tazenda."

"I do. The assault by your fleet was foreseen."

Grimly: "Yes, so I suppose. But not prevented eh?"

"No, not prevented." The First Speaker's emotional symbology was plain. It was almost a self-horror; a complete self-disgust: "And the fault is much more mine than yours. Who could have imagined your powers five years ago. We suspected from the start—from the moment you captured Kalgan—that you had the powers of emotional control. That was not too surprising, First Citizen, as I can explain to you.

"Emotional contact such as you and I possess is not a very new development. Actually it is implicit in the human brain. Most humans can read emotion in a primitive manner by associating it pragmatically with facial expression, tone of voice and so on. A good many animals possess the faculty to a higher degree; they use the sense of smell to a good extent, and the emotions involved are, of course, less complex.

"Actually, humans are capable of much more, but the faculty of direct emotional contact tended to atrophy with the development of speech a million years back. It has been the great advance of our Second Foundation that this forgotten sense has been restored to at least some of its potentialities.

"But we are not born with its full use. A million years of decay is a formidable obstacle, and we must educate the sense, exercise it as we exercise our muscles. And there you have the main difference. *You* were born with it.

"So much we could calculate. We could also calculate the effect of such a sense upon a person in a world of men who did not possess it. The seeing man in the kingdom of the blind— We calcu-

lated the extent to which a megalomania would take control of you and we thought we were prepared. But for two factors we were not prepared.

"The first was the great extent of your sense. *We* can induce emotional contact only when in eyeshot, which is why we are more helpless against physical weapons than you might think. Sight plays such an enormous part. Not so with you. You are definitely known to have had men under control, and, further, to have had intimate emotional contact with them when out of sight and out of earshot. That was discovered too late.

"Secondly, we did not know of your physical shortcomings, particularly the one that seemed so important to you, that you adopted the name of the Mule. We didn't foresee that you were not merely a mutant, but a sterile mutant and the added psychic distortion due to your inferiority complex passed us by. We allowed only for a megalomania -not for an intensely psychopathic paranoia as well.

"It is myself that bears the responsibility for having missed all that, for I was the leader of the Second Foundation when you captured Kalgan. When you destroyed the First Foundation, we found out -but too late—and for that fault millions have died on Tazenda."

"And you will correct things now?" The Mule's thin lips curled, his mind pulsing with hate: "What will you do? Fatten me? Restore me to a masculine vigor? Take away from my past the long childhood in an alien environment. Do you regret *my* sufferings? Do you regret *my* unhappiness? I have no sorrow for what I did in my necessity. Let the Galaxy protect itself as best it can, since it stirred not a whit for my protection when I needed it."

"Your emotions are, of course," said the First Speaker, "only the children of your background and are not to be condemned—merely changed. The destruction of Tazenda was unavoidable. The alternative would have been a much greater destruction generally throughout the Galaxy over a period of centuries. We did our best in our limited way. We withdrew as many men from Tazenda as we could. We decentralized the rest of the world. Unfortunately, our measures were of necessity far from adequate. It left many millions to die—do you not regret that?"

"Not at all—any more than I regret the hundred thousand that must die on Rossem in not more than six hours."

"On Rossem?" said the First Speaker, quickly.

He turned to Channis who had forced himself into a half-sitting posture, and his mind exerted its force. Channis felt the duel of minds strain over him, and then there was a short snapping of the bond and the words came tumbling out of his mouth: "Sir, I have failed completely. He forced it from me not ten minutes before your arrival I could not resist him and I offer no excuses. He knows Tazenda is

not the Second Foundation. He knows that Rossem is."

And the bonds closed down upon him again.

The First Speaker frowned: "I see. What is it you are planning to do?"

"Do you really wonder? Do you really find it difficult to penetrate the obvious? All this time that you have preached to me of the nature of emotional contact—all this time that you have been throwing words such as megalomania and paranoia at me, I have been working. I have been in contact with my Fleet and it has its orders. In six hours, unless I should for some reason counteract my orders, they are to bombard all of Rossem except this lone village and an area of a hundred square miles about it. They are to do a thorough job and are then to land here.

"You have six hours, and in six hours, you cannot beat down my mind, nor can you save the rest of Rossem."

The Mule spread his hands and laughed again while the First Speaker seemed to find difficulty in absorbing this new state of affairs.

He said: "The alternative?"

"Why should there even be an alternative? I can stand to gain no more by any alternative. Is it the lives of those on Rossem I'm to be chary of? Perhaps if you allow my ships to land and submit, all of you, —all the men on the Second Foundation—to mental control sufficient to suit myself, I may countermand the bombardment orders. It may be worthwhile to put so many men of high intelligence under my control. But then again it would be a considerable effort and perhaps not worth it after all, so I'm not particularly eager to have you agree to it. What do you say, Second Foundationer? What weapon have you against my mind which is as strong as yours at least and against my ships which are stronger than anything you have ever dreamed of possessing?"

"What have I?" repeated the First Speaker, slowly: "Why nothing except a little grain—such a little grain of knowledge that even yet you do not possess."

"Speak quickly," laughed the Mule, "speak inventively. For squirm as you might, you won't squirm out of this."

"Poor mutant," said the First Speaker, "I have nothing to squirm out of. Ask yourself why was Bail Channis sent to Kalgan as a decoy Bail Channis, who though young and brave is almost as much your mental inferior as is this sleeping officer of yours, this Han Pritcher. Why did not I go, or another of our leaders, who would be more your match?"

"Perhaps," came the supremely confident reply, "you were not sufficiently foolish, since perhaps none of you are my match."

"The true reason is more logical. You knew Channis to be a Second Foundationer. He lacked the capacity to hide that from you. And you knew, too, that you were his superior, so you were not afraid to play his game and follow him as he wished you to in order to outwit

him later. Had I gone to Kalgan, you would have killed me for I would have been a real danger, or had I avoided death by concealing my identity, I would yet have failed in persuading you to follow me into space. It was only known inferiority that lured you on. And had you remained on Kalgan, not all the force of the Second Foundation could have harmed you, surrounded as you were by your men, your machines, and your mental power."

"My mental power is yet with me, squirmer," said the Mule, "and my men and machines are not far off."

"Truly so, but you are not on Kalgan. You are here in the Kingdom of Tazenda, logically presented to you as the Second Foundation—very logically presented. It had to be so presented, for you are a wise man, First Citizen, and would follow only logic."

"Correct, and it was a momentary victory for your side, but there was still time for me to worm the truth from your man, Channis, and still wisdom in me to realize that such a truth might exist."

"And on our side, oh, not-quite-sufficiently-subtle one, was the realization that you might go that one step further and so Bail Channis was prepared for you."

"That he most certainly was not, for I stripped his brain clean as any plucked chicken. It quivered bare and open before me and when he said Rossem was the Second Foundation, it was basic truth for I had ground him so flat and smooth that not the smidgeon of a deceit could have found refuge in any microscopic crevice."

"True enough. So much the better for our foresight. For I have told you already that Bail Channis was a volunteer. Do you know what sort of a volunteer? Before he left our Foundation for Kalgan and you, he submitted to emotional surgery of a drastic nature. Do you think it was sufficient to deceive you? Do you think Bail Channis, mentally untouched, could possibly deceive you? No, Bail Channis was himself deceived, of necessity and voluntarily. Down to the inmost core of his mind, Bail Channis honestly believes that Rossem is the Second Foundation.

"And for three years now, we of the Second Foundation have built up the appearance of that here in the Kingdom of Tazenda, in preparation and waiting for you. And we have succeeded, have we not? You penetrated to Tazenda, and beyond that, to Rossem—but past that, you could not go."

The Mule was upon his feet: "You dare tell me that Rossem also, is not the Second Foundation?"

Channis, from the floor, felt his bonds burst for good, under a stream of mental force on the part of the First Speaker and strained upright. He let out one long, incredulous cry: "You mean Rossem is *not* the Second Foundation?"

The memories of life, the knowledge of his mind—everything—whirled mistily about him in confusion.

The First Speaker smiled: "You see, First Citizen, Channis is as upset as you are. Of course, Rossem is not the Second Foundation. Are we madmen then, to lead you, our greatest, most powerful, most dangerous enemy to our own world? Oh, no!

"Let your Fleet bombard Rossem, First Citizen, if you must have it so. Let them destroy all they can. For at most they can kill only Channis and myself—and that will leave you in a situation improved not in the least.

"For the Second Foundation's Expedition to Rossem which has been here for three years and has functioned, temporarily, as Elders in this village, embarked yesterday and are returning to Kalgan. They will evade your Fleet, of course, and they will arrive in Kalgan at least a day before you can, which is why I tell you all this. Unless I countermand my orders, when you return, you will find a revolting Empire, a disintegrated realm, and only the men with you in your Fleet here will be loyal to you. They will be hopelessly outnumbered. And moreover, the men of the Second Foundation will be with your Home Fleet and will see to it that you reconvert no one. Your Empire is done, mutant."

Slowly, the Mule bowed his head, as anger and despair cornered his mind completely, "Yes. Too late—Too late— Now I see it."

"Now you see it," agreed the First Speaker, "and now you don't."

In the despair of that moment, when the Mule's mind lay open, the First Speaker—ready for that moment and pre-sure of its nature—entered quickly. It required a rather insignificant fraction of a second to consummate the change completely.

The Mule looked up and said: "Then I shall return to Kalgan?"

"Certainly. How do you feel?"

"Excellently well." His brow puckered: "Who are you?"

"Does it matter?"

"Of course not." He dismissed the matter, and touched Pritcher's shoulder: "Wake up, Pritcher, we're going home."

It was two hours later that Bail Channis felt strong enough to walk by himself. He said: "He won't ever remember?"

"Never. He retains his mental powers and his Empire but his motivations are now entirely different. The notion of a Second Foundation is a blank to him, and he is a man of peace. He will be a far happier man henceforward, too, for the few years of life left him by his maladjusted physique. And then, after he is dead, Seldon's Plan will go on—somehow."

"And it is true," urged Channis, "it is true that Rossem is not the Second Foundation? I could swear—I tell you I *know* it is. I am not mad."

"You are not mad, Channis, merely, as I have said, changed. Rossem is *not* the Second Foundation. Come! We, too, will return home."

INTERLUDE

Bail Channis sat in the small white-tiled room and allowed his mind to relax. He was content to live in the present. There were the walls and the window and the grass outside. They had no names. They were just things. There was a bed and a chair and books that developed themselves idly on the screen at the foot of his bed. There was the nurse who brought him his food.

At first he had made efforts to piece together the scraps of things he had heard. Such as those two men talking together.

One had said: "Complete aphasia now. It's cleaned out, and I think without damage. It will only be necessary to return the recording of his original brain-wave makeup."

He remembered the sounds by rote, and for some reason they seemed peculiar sounds—as if they meant something. But why bother.

Better to watch the pretty changing colors on the screen at the foot of the thing he lay on.

And then someone entered and did things to him and for a long time, he slept.

And when that had passed, the bed was suddenly a bed and he knew he was in a hospital, and the words he remembered made sense.

He sat up: "What's happening?"

The First Speaker was beside him, "You're on the Second Foundation, and you have your mind back —your original mind."

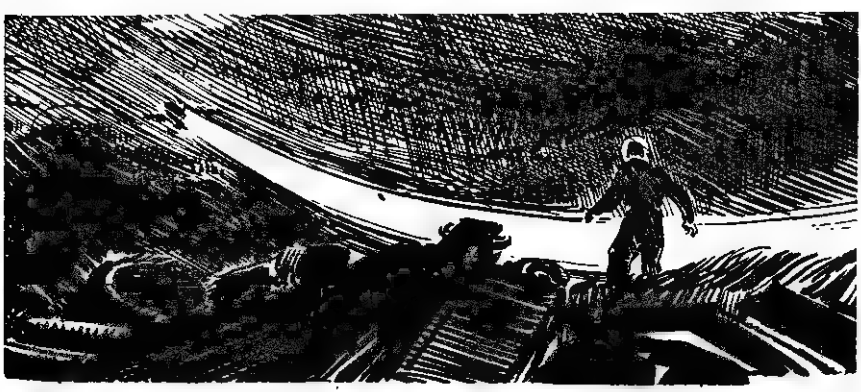
"Yes! *Yes!*" Channis came to the realization that he was *himself*, and there was incredible triumph and joy in that.

"And now tell me," said the First Speaker, "do you know where the Second Foundation is now?"

And the truth came flooding down in one enormous wave and Channis did not answer. Like Ebling Mis before him, he was conscious of only one vast, numbing surprise.

Until he finally nodded, and said: "By the Stars of the Galaxy—now, I know."

THE END.



Using a highly integrated mind to power time-travel means you'll never be away from your "machine"—but can also mean that certain periods of history are extremely dangerous to enter!

THE HELPING HAND

Illustrated by Cartier

BY BURT MACFADYEN

Zone 192-A-10
291400B, 2540 A.D.

Dear Jarl:

As a member of the Society of Former Americans, and a telewriter, you might be interested in my recent adventures in the Mad Period. A full account has already appeared in the Journal of Chrono-History but it is so cluttered up with unavoidable technical jargon as to be unreadable to a nonspecialist such as yourself. I'm not sure that I understand it either, although I wrote it.

Well, to gyre right into it, it was a hot summer day in the "month" of June, 1985—"A.D." of course—when I "arrived." (I feel a slight somatic conflict at describing sensum scanning in such fantastic and meaningless language! As you know, or ought to, "time" is an

abstraction like "space." Both are organs of sense perception—observer-functions in the dialectic. The chronal displacement process, which you will probably call "time traveling" in your telescript, thus involves merely a sensory re-orientation—sensum scanning in the jargon. The World Encyclopedia will give you the technical details, if you can read Karsch symbols.)

I had three reasons for being in the Twentieth Century. (My usual beat on field trips is the First Century Han Period in China—most fascinating.) I had to locate Kirn, another field worker who had vanished in the Twentieth and had not been reported in any other century. I had to check on the strength of the thalamic-stimulating MacDonald Rays—a solar radiation beyond the ultraviolet. If this radiation was at peak in the Twentieth, it might explain why the Mad Period was mad.

But, most important, I had to check the Loam mystery. It was Loam, you remember, who wrote the great book "Sanity" which had such an influence on the Twenty-first Century Scottish hermit and educator, MacTavish of Inniskilling—an historical turning point. Loam began his great work after escaping from confinement in 1985. And there was reason to suspect that his escape was aided by a man from the future.

We had to be *certain*—that was obviously vital.

Wherefore I found myself—after the usual dizzy sensation of hurtling through a nonexistent void—standing ankle-deep in dust at a country crossroads. A signpost said, "Bayeux—30 kilo" and an old Frenchman with a woodsman's ax on his shoulder was gaping at me. He stank most abominably—superstitious fear.

I said: *"Soyez tranquil. Quel est le mois?"*

He stammered, *"Juin."*

"Bien. Le vingt-cinq, peut-être?"

"C'est ça. Mais monsieur—monsieur est nue!"

Naturally I was naked—my clothes, nonmental matter being incapable of sensum scanning, were lying on the floor of my office in the History Building, five hundred years in his future.

I said: *"C'est ça—il fait trop chaud. Mais quelle est l'année?"*

"Quatre-vingt cinq—"

"Dix-neuf quatre-vingt cinq?"

He nodded dumbly.

That was fair shooting—for a target I'd been forced to use a *fête* held in Bayeux on the 20th of June, 1985. I'd missed it by plus five days, but that was normal. Since the Loam mystery was first on my schedule I had to displace to the United States of America—as it then was called.

I said, *"Meci mille fois,"* the old Frenchman answered automatically, *"Bien venu—"* and so far as he was concerned, I vanished back into thin air.

With sensory control, of course, you can't displace either in time or space without targets. Nobody can vize himself into a place he's never seen, unfortunately. And while I wanted to slip over to Westchester County, New York State—where

we suspected Loam was in jail—the only space target I had was the memory of an old photograph of a hamlet named Roebuck in Massachusetts—a photograph made in 1996, eleven years too late.

That was what I now mentally focused on and that was where I arrived next—right in the middle of a thunderstorm!

I had a spectator here too, I saw—I always regret a witness, for it invariably gives rise to still another supernatural legend. This one was a lean brown old man in ragged clothes. He sat on a curb in Roebuck's main street and nursed a half-full bottle in his hand while he stared at me.

He looked at me, then at the bottle, said, "Never again," and lurched to his feet, throwing down the bottle.

I said in Old American: "Just a minute," and tapped him on the shoulder.

He yelped: "No, no, I *won't* believe it!" and took to his heels through the pelting rain, leaving behind him the heavy odor of hysteria.

There was no use chasing him, of course. Rather than accept the simple fact that a man could appear out of the air he would cling to the notion that I was a ghost or an alcoholic hallucination. The irrationality of this Twentieth Century was its outstanding characteristic.

I walked down the deserted street looking for a clothing store. The rain didn't bother me, but I was still naked and this period labored under the influence of Nineteenth Century Puritanism. The spirit of Cotton Mather was still abroad in the land. Nudity was automatically associated with immorality.

Naked, I was actually liable to be thrown into prison for indecent exposure. Of course, no prison could hold a Scanner, but it might be awkward.

The lashing rain hissed on the pavement and stung my back. Intermittent lightning split the black sky overhead and thunder grumbled in the hollows of the air. Most of the inhabitants, I supposed, were cowering indoors away from the rain but the fact that a good sixty percent of the stores and buildings were boarded up rather puzzled me.

I came to a sign which said, in the old lettering:

General Goods
H. Witwer, Prop.

and turned in. A grille of steel bars covered the door, but a face appeared when I thumped on the glass.

After a long stare the door opened and a body joined the face.

He said, "What kin I do fur ye?"

There was no alternative—I had to lie, although I knew it was dangerous. I said: "I ran my car into the river and had to strip to swim out. I need clothes."

"Reckon you do," he grunted, unlocking the grille. "Come in."

He snapped on the curious archaic electric lighting of the period and had another long look at me.

"Big, ain't ye?" he said. "Don't know's I kin fit ye but we'll have a

look." He started in behind a long table, hesitated then said, "Ain't one o' these Loamians from Monset, are ye?"

Loamians! This was puzzling. "No," I said, "I'm certainly not a Loamian. You have them around here?"

He spat. "Sure. What'd you think?"

"I wasn't sure."

He began to paw through stacks of clothes.

A field worker is always under a great disadvantage, especially in an unfamiliar period. I could hardly follow the old fellow's colloquial speech. My own sightly stilted Old American had been learned from tapes, naturally, since nobody in the Twenty-sixth Century speaks it. And, although I had a general grasp of the Twentieth—the four major wars, thirteen major revolutions and twenty minor, the Great Book Burning in '98, the Science Revolt in '95 and so forth—I was very sketchy on the little intimate details with which ordinary social conversation in any time period is largely concerned.

My friend Mr. Witwer turned and tossed a garment in my direction. "Ye kin try that on for size," he said, "and cover up your nekkidness. I'll have to look in the back room—your sizes ain't made much."

He went through a door and I struggled into the ill-fitting, repulsive garment. It was a one-piece affair with buttons up the front and a curious flap to cover the buttocks. We habitually go naked, weather permitting, and the rough synthetic wool made my skin itch but if this was what Americans wore in the Twentieth Century I would have to bear it without scratching.

Witwer was gone but I could still smell him, and suddenly I was aware that his personal odor had changed subtly. Shortly he came in again, looked at me furtively, and went back to his shelves. His smell was louder than ever, the smell of fear, and I knew what he had done in the "back room" as if he had told me verbally.

I said: "Don't bother—this garment will suit me very well."

He looked at me sharply from under long gray eyebrows and grunted, "Cain't go about the streets in long underwear, kin ye? Just wait a minute."

The policeman arrived in about four minutes.

He was a huge lumbering individual in a blue uniform. He was nearly as tall as I—about two hundred centimeters—which suited my purpose quite well.

He gave me the hard stare common to police officials of all periods. "This the fella, Harry?"

"That's him." The storekeeper spat on his own floor again—a disgusting habit. "Got a funny accent I cain't place. Claims he ain't a Loamian but he's tanned all over, black as an Indian, like he went nekkid. Says his car went in the river. Ain't no river near a road around here."

"You done good, Henry," the policeman said. "Let's see your iden-

tity card, bud."

"It's in the river," I said.

"What river?"

"The Allegheny," I said, picking a name at random.

"That's quite a piece from here."

"It did seem rather a long walk," I said.

My friend Witwer put in: "He thought long underwear was clothes."

The policeman puzzled over that statement. He gave up. He said, "Well, you may be all right, but we got to check -that's the law nowadays. Everybody gotta have a card. You better come along with me in the car. And don't try nuthin'."

Witwer produced a raincoat for me and unlocked his door. I followed the policeman into an ancient automobile and we moved off down the street. It was still raining.

I have recorded the above dialogue rather fully, Jarl, to indicate the profound irrationality of these people. Their thought processes were purely thalamic, unhindered by any reasoning impulses from the forebrain. Consider Witwer's reasoning: I had a strange accent and I had been naked—therefore I was an enemy, although I had offered him no harm. Fantastic, isn't it?

The rest of the incident was field worker's routine. I understood the operation of the automobile before we had gone a mile. I put my foot on the pedal used to stop the car and took my policeman friend by the throat. His strength was nothing against mine. My thumbs pressed on his jugular just long enough to render him unconscious. I stripped off his uniform and donned it. I left him at the side of the road covered with my raincoat and drove off rapidly south—trying to look as much as possible like an eager policeman in pursuit of a dangerous criminal.

A small worry tugged at my brain as I drove. As you know, Jarl, the ability to "move" at will through "time" or "space"—those silly concepts again!—by sensory control is achieved only by the most rigorous type of right thinking. The old mystics were right. The way to Power is the Eightfold Path. But within the space of a few minutes I had told several minor lies and done violence on a human. Furthermore, I was right in the heart of one of the maddest periods of history. My actions and my environment would inevitably dull the keen edge of my control.

I wondered if that was what had happened to Kirn. He had always been slightly unstable, for a field worker.

I remembered the time I myself had nearly become lodged in Renaissance Italy as a direct result of aiding a Borgia. And I recalled the field worker Nassor, whose experiences in Sixteenth Century France made him so neurotic that stasis set in, and he spent the rest of his life in that century, writing silly verses under the name of Nostradamus.

The occupational hazards of a chronal missionary, Jarl!

Even to have such thoughts was an ominous symptom, so I cleaned

them out of my mind and concentrated on my problem. All we had on the Loam affair was a torn, ancient clipping on yellowed paper. I recalled it:

. . . and at roll call Loam was reported missing. An eerie atmosphere of supernatural mystery shrouds the whole affair. Who was the six foot six giant who—so it is claimed by eyewitnesses—*stepped* through the cell wall? *What* was he—ghost or illusion? And, equally important, who or what was Loam himself? Mad criminal or saint? Confined for three years in the Westchester—

And there the fragment ended. From this, I was to find Loam. Measurement of the radioactive carbon content of the ink had dated the fragment as late June, 1985. And today was the 25th.

A sign flashed past: "Winster, 20 miles" and an instrument on the control board of my borrowed car began to click loudly. I noticed that the landscape on either side of the highway had a wildly tumbled appearance, as if a giant had stirred it up with his heel. I halted the car and investigated. The instrument appeared to be a modification of the ancient —or rather current—Gieger-Müller ionizing radiation counter.

Well, of course, the fact that I was passing through a radioactive area didn't bother me since we are all naturally immune nowadays. It was probably a relic of the third or fourth global war of the Twentieth Century. It possibly explained why the inevitable police pursuit had not appeared—for in that century, as in all unstable cultures, the state security organizations were quite efficient. But the police would be unable to follow me through what was to them a lethal area.

Ten miles farther on the counter had stopped clicking and my car had stopped running. I'm not a technician but it seemed to me that the fuel had given out, so I took a selection of maps from a small cupboard, threw away the policeman's shoes, and set out on foot.

I had driven through the thunderstorm and the air was clear. Dusk was beginning to shadow the landscape. I strode along, my senses tuned to the thousand clashing odors of the countryside—no man of the Twentieth Century, of course, has our sense of smell—but I had not gone five miles before I became conscious of danger from two different directions.

A faint humming crept down from the sky. I saw a growing speck in the west. It was probably a police helicopter, but it did not worry me unduly. The other sensory signal was more baffling.

This was the scent of *dog*—but dog with a subtle difference. It smelled, in fact, like dog gone mad, and I didn't like it. The short hairs on the nape of my neck bristled. Then I saw them.

Over the crest of a small hill they came pouring down towards the highway, heading straight for me—a pack of a hundred or more dogs of all shapes and sizes. In the lead, bounding with huge strides, was a magnificent Great Dane—a vast brute who must have weighed close to seventy kilograms.

Now, as you know, Jarl, the singular *rapport* which we have towards dogs is a comparatively recent development. I think it appears first in the Twenty-third Century. It's probably due to our heightened sense of smell. But whether it would serve me here, I didn't know —I was badly mauled once by a pack of wild dogs in an old Hindu village in the First Century. But I knew I couldn't fight a hundred. No man can move fast enough.

So I stood quite still and relaxed.

The leader was almost on me when a note of puzzlement crept into his savage baying. I suppose he expected me to run for my life. He stopped short and the rest of his pack halted and milled in confusion. The big Dane lifted his massive bronzed head and, from a distance of a dozen paces, analyzed my scent. He looked confused. I didn't smell right.

He came closer, cautiously, and then he let out a piteous yelp—one of the most pathetic sounds I have ever heard —and began to inch towards me on his belly.

The poor brute was trying to apologize.

I squatted down on my heels and touched noses with him. I think he thought I was a new type of dog —half man, half canine. His pack gathered round, sitting on their haunches, silent and awed and we had a conference.

My nose told me a lot. These dogs were neurotic, every one of them. Trained for centuries to hunt with men, they'd been abandoned by men. Old loyalties fought with the hunger drive to produce a hopeless conflict.

It was clear now why Roebuck had been half empty and why the doors and windows had been protected with steel bars.

But I had no time for either philosophy or canine psychiatry. A spinning shadow drifted across the highway and I looked up to see the helicopter a strange, ungainly air machine—land not sixty feet away by the roadside.

Two men in blue uniforms appeared. One called, "O.K., don't try muhin'!"—and shot at me. The hackles on the Great Dane rose and he looked up at me.

Well, Jarl, my only excuse is that I needed the helicopter and that I thought I could control my new allies.

I rose and pointed. "Take them —but don't kill!" I said, and in a second the pack was on them. Their guns were useless. They went down, smothered under an avalanche of dogs.

All except my big Dane. He stood looking on like a commanding general. Then he helped me get the dogs off their victims, but by then it was too late.

Well, now I was a murderer twice over. The fact that the police were the hired killers of the totalitarian government established in 1981 in no way absolved me for they were still humans. And what the inevitable subconscious conflicts would do to my sensory control I didn't like to think.

At any rate, I had a helicopter.

I climbed in. The pack leader put his huge fore paws on the side of the machine and pleaded with me. I said: "Come on, then," he jumped in gladly, and after a brief study of the unfamiliar controls we took off.

On the highway below the pack looked up and howled farewell.

It was well named the Mad Period.

I studied the map I'd taken from the police car. Sure enough, the town of Monset mentioned by Witwer was in Westchester County. I located my position and flew to Monset through the deepening dusk. My Dane slept trustingly on the floor of the machine, his big paws twitching in dream. I didn't know what part he was to play in getting Loam out of jail but I was sure he would be useful. Improvise, improvise, always improvise—that is the field worker's slogan.

The men we contact in time who later turn out to be Destiny's key figures, in their own current environments are usually the most obscure individuals it is possible to imagine. You will remember the famous case of Moses, Jarl. A historical figure for three thousand

years—afterwards. But it took me two years in his own time to find him—an obscure herdsman, thought to be deranged and given to visions by the few friends he had.

So it would be with Loam. Of biographical data on this great thinker there is, in our century, nothing whatever. Yet by his influence on MacTavish of Inniskilling he ranks with the man who taught Lao Tse.

It was dark when I reached Monset, so I landed the helicopter in a small canyon near the darkened town, walked away from it three miles and slept in a tree, with my faithful Dane on guard at the foot of it. Waking at noon I threw away the policeman's coat—the trousers were not so distinctive—walked into town and ate a meal at a small restaurant. The food was abominable, naturally—in that century they were still *cooking* food, thus toughening the fibers and reducing the vitamin content quite effectively.

The fact that I wore no shoes seemed to convince the waitress that I was a person of small repute. She said, "On the bum, big boy?" I said, "I never wear shoes. Why do you?"

"Oh, I dunno," she said, looking down at her feet incased in a few shreds of plastic, mounted on low stilts. "Habit, I guess. These shoes are killin' me. If I had any sense, I'd take 'em off. Maybe you got something."

But, of course, she didn't take them off. I bought five kilograms of meat scraps and bran for my big Dane. While he was wolfing the food hungrily there was a commotion in the street outside.

"Those crazy Loamians!" said my waitress.

I was at the window in a second.

A small band of men straggled down the center of the street. They were led by a tall lean man with white hair and sharp eyes. Some carried banners bearing such emotional slogans as:

"RELEASE LOAM NOW!"

"LOAM IS THE NEW REDEEMER!"

"RELEASE LOAM AND STOP THE WAR!"

"LOAM IS SENT TO SAVE US!"

"IN THIS MAD WORLD ONLY LOAM IS SANE!"

"JOIN THE LOAMIANS AND FIND PEACE OF MIND."

"GIVE US LOAM THE MASTER!"

And every man was stark naked.

That was the significant detail.

I threw the policeman's money to the waitress, stripped off the policeman's trousers and Mr. Witwer's underwear, stepped out of the restaurant and slipped into the band as they marched past. I relieved an elderly man, who looked tired, of his sign—it said "WE WANT LOAM!"—and slouched to minimize my height, the Dane following close at my heels.

The elderly man said, "Are you with us, brother?"

I said, "I have come from a great distance to join you, brother."

He looked from me to the savage

dog and his eyes widened. "Isn't that one of the wild ones?"

"It was."

"Then you have the Power, too!"

"Yes, brother," I said solemnly.

This weird dialogue was interrupted by another appearance of my friends the security police—the citizens of that century were continually bedeviled by these watchdogs of the state. This time four small open automobiles filled with armed men in black uniforms appeared from side streets to confront the head of our ragged column. A second four, moving abreast, came up in our rear, trapping the body of the marchers between them.

Banners were discarded as the Loamians scattered in panic. The police started shooting. My elderly friend groaned. I picked him up and slung him over my shoulder—I'm afraid my motives weren't purely altruistic—called the dog to heel and ran into a narrow alley away from the confusion. The alley ended in a low fence, which I hurdled with my burden. I set him down.

I said, "Quickly! Where is our headquarters?"

"This way," he panted, and we set off between two houses.

Ten minutes spent dodging up and down alleys brought us to a half-demolished building. My friend picked a way through the rubble and dropped into a dark hole. I followed, calming the Dane, who was nervous. We went along a low tunnel, my friend rapped a signal on a steel door and a man in a white gown admitted the three of us to a large low-ceilinged room dimly lit by gasoline lamps. The tall leader was there.

Gowns were produced and we slipped them on. My friend said dramatically, "I bring one who has the Power!"

The white-haired leader gave me a doubtful look. "Let him prove it."

I decided that I had finally found a rational man. "I have many powers," I said. "Which one are you interested in?"

"Who are you and where do you come from?"

"My name is Nerl," I said. "I come from Lhasa."

Somebody said, "A Tibetan!" and a murmur went around. Tibetans are always thought to possess magical powers by persons who have never met them.

"Can you speak with the beasts?"

"Certainly," and I murmured to my Dane. The massive dog went over to the leader, peered into his face—the white-haired man did not flinch, for which I gave him credit—and then returned to nuzzle my ear. "The dog says that you are an honest man," I said, "and a true friend of Loam, whom I have come to aid."

Another murmur. "The dog is very shrewd," said the tall man, cocking an eyebrow. "What else can you do?"

"This," I said, and displaced across the intervening space to his side. To my audience it probably looked as though I vanished and reappeared twelve feet away.

That got them. "I'd better talk

to you alone, I think," the leader said. He rose and I followed him into a small room furnished with a bed and a desk.

He closed the door and we sat on the bed. He said, "My name is Jarvis. I was a physicist before the current war so forgive me if I seem a bit cynical. How'd you do that last trick?"

"It's hard to explain without a certain development of tensor calculus unknown in this country," I said. "But it isn't even new. You call it astral projection—ghost appearances and what not."

"Superstition!" he nodded, contemptuously. "Yes, we're a credulous lot—like those crackpots out there. But I have to work with those who will follow me. What do you want?"

"My mission is to find Loam. Where is he?"

He gave me a grin. "In the Westchester County Asylum for the Insane."

I laughed. The greatest mind of the Twentieth Century—and they had him in an asylum. The pattern was familiar.

"Why?"

"For preaching sanity. The State psychiatrists had him committed to shut him up. Although—" Jarvis frowned thoughtfully—"there *were* times when he seemed to talk wildly, irrationally."

"Let's get him out!"

"Yes, but how? The guards are armed and we are not. Besides, we are sworn not to take life—that is the key thought in the Loam philosophy."

I concentrated for about five seconds. "Is there a wild dog pack near here?"

"Several."

"Good."

I called my Dane and gave him instructions while Jarvis watched curiously, doubtfully. The big dog left eagerly. "Now," I said, "let us make plans. What transportation can we steal?"

It was midnight when Jarvis and I lay in tall grass across the road from the huge steel gate of the asylum on the edge of Monset. A thin fingernail of moon hung behind the bulk of the huge building behind the high wall. Beside me crouched the Dane and to right and left the wild hunting pack my dog had rounded up waited under bushes. I had spoken to each dog individually this time. I didn't want any more killing—for my own sake as much as anything, I must admit.

Almost everything I had done so far had been a direct violation of Twenty-sixth Century Ethics. I was heading for a beautiful neurosis.

The gate opened to let a car out. The guard came forward to close the gate. I nudged the Dane. The big dog went across the road like a terrible shadow and the guard was knocked flat on his back. The Dane stood on his chest and bayed.

That was the signal. The wild dogs streamed across the road and in a few seconds they were all through the grounds, filling the night with their hellish howling. Searchlights went on. The guards

—the asylum held political prisoners, too—on the walls began shooting.

By that time I had the unconscious gate guard's uniform off. I tucked it under my arm and ran for the main building, dodging the moving circles thrown by the searchlights.

I knew the location of Loam's cell from a plan Jarvis had secured. Most of the guards had been drawn away outside by the menace and clamor of the wild dogs. And, of course, they would never believe that a savage hunting pack could be so controlled as to aid in a jail break.

I encountered one guard—which gave me a set of useful keys—and then I was in Loam's corridor. The scent of madness is not pleasant and I was heartily wishing I was out of it when I caught another odor.

It was the odor of a man from my own time.

Was this the "giant" who stepped through walls?

I came to Loam's cell. The fourth key opened it. The door swung open—and the scent was stronger than ever. And at the sight of the tall man who rose from a chair in the corner I laughed aloud.

Loam was Kirn.

I had been concentrating so rigorously on the Loam matter that I had almost forgotten the field worker I had also been sent to find. But of course this explained his singular disappearance—we had been looking for a Scanner, not a citizen. This was why the Loamians marched naked—they were imitating Kirn. And it explained that silly "Power" I was supposed to possess—naturally Loam could talk with animals too—we all can.

I said, in Twenty-sixth Century Damian, "Kirn, it's me—Nerl! Are you all right?"

He rubbed his forehead and stared at me. "Who are you?" he asked in Old American.

Dissociation! That was why he had never returned. He'd been too long in the Twentieth Century. The slight instability I had always suspected had increased in the neurotic environment. A perfect split—he'd lost the keen edge of his mind, part of his memory, and with it all the ability to Scan. He was a castaway five hundred years in his own past.

Well, there was nothing I or anyone else could do about that. I couldn't get him back to his own time—I might have trouble getting myself back.

The immediate job was to get him to his friends outside.

"Get that smock off," I said in American. "Get these on. Hurry!"

He looked confused, but he got into the guard's uniform fast enough. The uniform was a bit small but it would do. "Here's a gun," I said, giving him the weapon I'd taken from the gate guard. "Run for the main gate—you'll find Jarvis with a helicopter outside. Go with him and don't forget you've got a book to write."

"How did you know that?" he asked.

"Never mind—run! If anybody

stops you, say you're going to shoot some dogs."

He was rational enough to obey without question. As he vanished down the corridor I went back into his cell and closed the door.

It had been my intention, of course, to simply displace myself outside—using the road as a target—check to see that his escape was complete and then return to my own century. I'd had enough of the Twentieth. Two parts of my assignment were finished—a fresh field worker could check the MacDonald radiation.

So I sat down on the hard bed, visualized the road outside the asylum, integrated the Karsch symbols and waited expectantly for the curious jerk which usually accompanies a space displacement.

It didn't come.

The cell stayed around me.

Sweat broke out on my brow and my heart speeded up. Was I going to be stuck in the Mad Period, too? Had the inevitable subconscious conflicts engendered by a neurotic environment dulled my sensory control to the fatal degree?

I let every muscle go limp and breathed with a steady rhythm. My control wasn't complete—I could still hear. Doors were being flung open and closed outside. They were checking for missing inmates and prisoners.

I made a stronger effort and the sounds faded. Darkness and silence closed in on me as I approached complete control. My heart slowed down to forty, thirty— From a great distance I was conscious that my cell door was thrown open. I vized again.

Space yielded reluctantly and I found myself on the road outside the prison walls.

I was sweating. It had been too close for my peace of mind.

I looked up into the night sky in time to see Jarvis' helicopter moving into the east. So Loam—or Kirn—had got away all right.

A cold muzzle touched my hand. My faithful Dane wagged his tail. I discovered suddenly that my arm was bleeding. One of the guards must have taken a shot at me in the cell at the last moment. He would see I wasn't Loam.

So *I* was the "six foot six giant who stepped through the cell wall!"

Strange are the ways of destiny, Jarl.

I walked to the canyon where I had hidden the police helicopter and flew south while the Dane slept on the floor. I needed rest—and mental peace. I knew I was in no shape to scan myself back to the Twenty-sixth Century.

As we flew I thought about Loam, or Kirn as we knew him. He was stuck there, poor devil. He would never know it, of course. It was ironical to think that the book he would write could have been written by almost anyone in our century—

By the way, Jarl, I hope you won't be bothered by any silly ideas of paradox. There isn't any paradox involved, although it would take Karsch symbols to prove it. Verbally, the nearest I can come is to

point a parallel. You'll find an exact analogy in an ancient "radio" circuit—"regeneration", where part of the output of an amplifier is fed back in the right phase to reinforce the input.

That's what happened in this little chunk of history. "Sanity," which Kirn-Loam was to write, came from his fragmentary memory of Twenty-sixth Century education. MacTavish of Inniskilling was the man who fought to have it adopted. Thus the use of Kirn-Loam's principles led to Twenty-sixth Century education.

Just a case of positive feedback.

A genuine paradox never occurs—obviously, it can't.

How did I get back?

Well, that was a detail. To get back my full control I needed an environment resembling our own. I found it in New Mexico after a few weeks of wandering with the Dane. The Zuñi culture was the only oasis of sanity in that delirious world.

These Zuñi lived in small villages along the Colorado River, preserving an ancient, sober culture in the midst of social chaos. They lived without jurisdiction, almost without authority, as we do, and social control was by intricate ritual. I learned the language within a few weeks and actually became a quite popular kachina priest.

I regained my control—I showed my fellow priests some of the exercises we use—and one day said farewell to my Dane. In exactly zero time I was back in my office in the History Building and began to write my report. The whole affair had taken about five minutes—our time—although I was six months older.

The MacDonald radiation? Let somebody else find out why the Mad Period was mad! I hope my next assignment is something safe, like the Carboniferous Period.

Yours,

Nerl.

THE END.

IN TIMES TO COME

Next month we have Alejandro's third cover—this one another of his purely symbolic covers. And he's working on another one. Your comments will, of course, be welcomed.

Doc Smith's "Children of the Lens" will conclude in the February issue, of course—and going one month further into the future, there's a sequel to "With Folded Hands . . ." by Jack Williamson coming up. It'll be our next novel—and will explain the "...." with which the title of the novelette ended!

But the feature novelette next month is by a fellow we've heard from before—Ted Sturgeon. It's called "There Is No Defense", but it is *not* about atomic bomb warfare. it *does* contain a nice proposition, and makes a fascinating yarn. There's an old saying "It takes two to make a quarrel"; that isn't so at all. The fact that it takes only one to make a quarrel is proven in the beginning of this yarn—and, at the end, they find it takes nobody at all to make a quarrel!

THE EDITOR.

ADVENT

BY WILLIAM BADE

***When** men have forgotten the truth—somebody will invent a myth. And after that myth has been accepted, somebody will defend it to the death. The other guy's death, of course . . .*

Illustrated by Cartier

"But he *was* wrong," Hinsie said. "I looked it up, just to be sure. At least two books mention that Lassek was a tanner's apprentice as a boy."

The High Superior leaned back in his chair, his lined old face twisting into a bitter scowl as he looked at Hinsie. He sighed. "You're only a boy," he said. "There's a lot you don't know. But as head of Breck I can't let you break down discipline here, and as a Tuylan I can't let you get wrong ideas as you seem to be doing." He stopped and scowled again.

Probably the old tyrant was going to put him on another fast. Of course, there were worse things he could do.

"Hinsie," the High Superior said, "you're young, and what you need is discipline. Young people easily go astray, if they're not watched. I'm putting you on a fast. Start today. Bread and water. I'll decide later how long it'll last, after I've seen how your

attitude has improved. *Also,* you'll stay out of the library from now on. You've just been wasting your time with those books. They're too advanced for you. All you can do with them is find impious meanings in them that are not really there. Now, go out into the court and read Lassek until morning lunch."

Hinsie didn't move. "Not use the library?" he said. "But how can I learn?"

"Read your Lassek, boy! The library is for men older and wiser than you. You can't interpret the old books. You don't know enough yet. Now—"

Joining the monastery had been a mistake. Hinsie didn't blame himself. He had been too young, when his father died, to estimate the chances of the thing properly. But it was clear now, after fourteen hundred days, that life at Breck was going to be one long fight against being pressed into the monastic mold.

"Now," the High Superior said, "go out and read your Lassek."

Hinsie turned, then stopped. The High Superior's room, like all the other rooms in the monastery, was a gloomy place. Its two small, high windows opening into the courtyard normally let in so little light that the High Superior had to do all his reading outside. But now the room was getting lighter and lighter. Brightness was streaming in through the windows from outside.

"What—?" the High Superior began.

There was shouting outside, startling in the usually serene walls of Breck. There were running steps in the corridor and a bearded superior stuck his head in the door.

"*It's a god-light!*" he shouted. "Come on out!"

"*A god-light?*" The High Superior pulled up his long gray robe with both hands and ran for the door. Hinsie followed, suddenly dizzy with excitement.

The brightness in the courtyard made Hinsie's eyes ache. All the people of the monastery seemed to be out there. The brick and stone walls of the buildings sparkled, and the sky—Tuyl, the sky! -was so dazzling that it was pure agony to look at it. Some warm spirit seemed to reach down out of heaven and caress the skin of Hinsie's face and arms. The dark cloth of his novitiate tunic became warm to the touch.

"Down! Down! All of us!" The High Superior's voice was excited and urgent. "Down on our knees and pray."

Obedience swept across the yard like a hot breeze. The novices, the superiors, all knelt with their arms hanging at their sides and their faces turned blindly upward toward that blazing open door to heaven. Hinsie felt the gravel of the yard cutting into his knees, and that blinding light in his near-closed eyes and that uncanny warmth on his face.

"Oh, mighty Lords of the Sky," the High Superior was intoning, "we, thy degenerate children's chil-

dren, are smitten by Thy sign. We plead for Thy great mercy on our misdeeds. Oh, grant us wisdom that we may understand Thy will and desire. We are but—"

Hinsie's eyes were beginning to get used to the glare. He squinted up at the sky. Only part of it was especially bright. An indistinct dividing line ran overhead, on one side of it ordinary sky-gray, on the other this most extraordinary brilliance. Wyler, in his "History of the Miraculous," had described a similar feature in the god-light of the 2146th hundredday. That was interesting, but did not explain anything.

The High Superior went on and on, working up to the point where he would implore the Skylords to restore humanity *now* to its divine heritage. Finally he concluded his prayer with a fervent, pleading exhortation that the human race had surely suffered enough, citing several examples from recent history to prove his point. Then he ordered all the people of the monastery to lie on their faces on the ground, and pray for their own souls.

After a while the light dimmed. When Hinsie looked up, the world seemed as gloomy as if night were beginning, although it was only time for the midmorning meal.

The god-light was over.

The monastery grew all its own food in an extensive set of gardens outside the walls. The novices did the work. A couple of days after the god-light, Hinsie was out with about a dozen of his fellows, clearing weeds out of one field.

"I asked Superior Koupal about it," a red-headed novice named Osler said. "He thought that the Advent might come just any day now."

"The Council of Superiors wasn't so sure about its being in the near future," another said. "But at least it was sure that the time has finally come." He grunted as he lifted a basket of uprooted weeds, then went on, "I can't get over the good luck we've had to be alive *now*, of all the ages since the Beginning. When I think that we, of all the generations of men, have been selected for the Advent . . ." He laughed. "It's almost hard to believe."

"It was foreordained," the redhead said. "The earliest writings refer to this time as the day of restoration."

Hinsie stood up with a load of weeds sagging in the front part of his tunic, held apronlike by the hem. "I wonder," he said. "At seven of the ten god-lights in the last four thousand some hundreddays, someone has predicted that the Advent was at hand. Usually it was on just that same basis. I mean, that old writings and traditions indicated each of those periods as *the* time. I don't think it would do to feel too sure that this time the prediction is right, despite the fact that it had been wrong every time so far."

Red-headed Osler spat. "You make me slightly sick," he said. "Hinsie, why can't you catch on

that you're not really smarter than the whole Council of Superiors? It shows people how conceited and stupid you are, which is all right; but you'll get yourself into trouble one of these days if you don't watch out."

Hinsie smiled forcedly. "I like you, too," he said. He dumped the weeds into a basket, picked it up, and walked away. He should never, never have joined the monastery.

It was perfectly clear to Hinsie that the god-light, although an impressive and mysterious thing, did *not* presage the coming of the Skylords. Perfectly clear. The idea was ridiculous. Men had been predicting the Advent on an average of once a century as far back as the histories went, and nothing had ever come of it.

Hinsie and Osler and another novice were making paper when the news came. The novices collected rags from the peasants of the surrounding country and, when they had a sufficient supply, pulped them and made them into the paper the superiors needed for new books.

Osler stopped stirring the steaming vat of rags for a moment and pushed his red hair back out of his eyes. "Superior Koupal," he told the tall novice working with him, "has promised to help me make a special study of the nature of heaven."

"That's nice of him," the tall novice said.

"There isn't much on that in the library," Hinsie put in. "Wyler mentions a couple of saints who had visions, and some of Lassek's books tell old traditions about the world above the sky. Actually, the different versions vary a lot, so I don't think you'll find out too much."

"If you don't stay quiet," Osler remarked, "I'll quiet you."

Hinsie shrugged and put his attention back to the business of felting the pulp into paper by means of fine fiber screens. Things went along pretty quietly for a while, practically the only sounds in the room being the occasional noises of stirring and scraping that accompanied the work.

Suddenly a growing sound of shouting began outside, many voices raised in joy and hysterical excitement. Osler and the tall novice looked at each other questioningly and hopefully. Hinsie stopped his work and went uneasily toward the door.

Outside in the courtyard, novices were laughing and shouting and running around. One was going back and forth between the statue of Breck and the novitiate dormitory by means of a series of hand springs. He finally collapsed hysterically helpless on the ground. The superiors, their customary dignity forgotten, were embracing each other and the novices and praying to Heaven, or simply standing around so filled with emotion that they couldn't do anything at all.

"Is it the Advent?" Osler demanded of another novice who was

crawling past on torn and bloody knees, his face turned to the sky, sobbing and smiling.

"The Advent! The Skylords have come! A messenger just came from Beston." He crawled away, tears on his cheeks.

Osler and the tall novice started thumping each other on the back, shouting for joy. Hinsie was silent.

A few novices started singing, an old chorus about "The day when the Skylords come and carry us all away." It spread until everyone, even the superiors, even Hinsie, was singing it. It was supposed to be a sad song, but now it was triumphant as the battle-shout of an army charging a hostile wall of shields and sword-points.

The Skylords had come.

For a few days everybody at Breck went around in a state of hysterical anticipation of the next world. Nothing happened. The thought occurred to Hinsie that reports *can* be false and mistaken. The monastics had been extraordinarily ready to accept this one as true. But in the following weeks more reports came in from Beston, confirming and adding to the first one. The gods had taken certain citizens of the city into their tremendous metal vessel. They had been seen flying about over the countryside. Then they had released the captured mortals with the command that representatives should assemble from all parts of the island of Llorda at Beston, to confer with them. The High Superior of Breck, naturally prepared at once to set out with a few superiors and novices for the city.

Hinsie was excited. Here was the chance of a lifetime, of a thousand lifetimes. Dozens of generations had passed before, who could only guess at the accuracy of what was written in the old books and said in the old traditions. *He* could go to Beston and see for himself.

So he asked the High Superior for permission to go along on the trip to Beston.

"My boy," the old man said, "I'm glad to see that you finally do believe and have a sincere wish to submit to the lords of the world. But I'm sorry, I just can't take you along. I've already chosen the novices who are most deserving of that honor. And even if there were room, I wouldn't take you anyway, much as I hate to say it. You see, the Skylords will undoubtedly base their final decision as to the present fate of the world on their judgment of the representatives that come to Beston. And you . . . well, you have shown very impious leanings. I'm sorry.

"Now, I'm busy. Don't be too disappointed. I think you'll get into heaven all right, if you don't go back to your old ways. Good-by."

Hinsie went slowly out into the courtyard and sat down on a stone bench. For a while, what had happened did not affect his emotions. He just sat there dully staring at the ground. He would not go to Beston, then. He would hear the

reports of the great things that were going on there, but he would not see the events themselves.

Oh, he should never have joined this monastery!

It grew darker gradually. The bell rang for dinner. He went to the dining hall and made short work of his hard piece of bread and cup of water. Then he went out again and sat in the evening gloom, morosely surveying his probable future in the monastery. There would be the dislike of the other novices and the distrust of the superiors. The library barred from him, he would go on in ignorance about the things that really mattered.

It was a black prospect.

So after a while he went to the little factory where the paper was made and took a stained, ragged tunic some frugal but pious peasant had given the monastery as raw material. He exchanged it for his novitiate gown. The gate of the monastery was guarded, and Hinsie doubted his own ability to force his way out without raising a row that would bring pursuit on his trail too soon. There was a tree just inside the wall at one place, and he might be able to climb it.

The wall was ten feet high. He could not, therefore, scale it directly. The tree proved to be difficult in itself, so large around that it was hard to climb. He tried several times, and failed. Any moment, someone might notice that he was missing and start a search. It would just about ruin his already poor position in the monastery if he were to be caught trying to escape. The least alarming aspect of recapture was that he would never be given another chance to get out. Violations of the monastic oath could be punished with anything from a mild flogging and fast to death by torture. Trying to escape was one of the more serious offenses.

At last, trembling and breathing hard, he reached the lowest limb. It was a fearsome drop from the limb to the top of the wall, with a good chance of breaking a few bones in the attempt. He summoned courage, and let go. Landing with bended knees on the yard-wide top of the wall, he almost rolled over the inner edge, but saved himself.

When he was finally standing on the firm ground outside the monastery, it was only the knowledge that pursuit might be starting any time that kept him from collapsing. But he was free, with the whole long, dark night ahead of him for travel.

He made the most of it, took a roundabout path to throw off pursuers, and before noon the next day was safely hidden in the waterfront area of Boston.

Hinsie was walking down one of the city's ancient streets. The great blocks of stone underfoot had come originally from the mountains forty miles inland, and now were deep-worn and cracked. Once Boston had been the capital of the world.

Out of the crowd on the street,

one face caught his eye, that of a hard-looking young man who was staring at *him*. After a moment, he recognized the fellow. He was an old friend of Hinsie's from childhood days.

"Hello, Thad," Hinsie smiled. "It's a long time since I've seen you."

"Yeah. I'll bet you're here to see about this Skylord bus'ness."

"Uh huh. What've you been doing?"

"Pullin' an oar, most of the time. I've been around quite a bit—just like you and me used to talk about. Seen the mainland and most of the islands."

"I just got into town," Hinsie said. "Where are the Skylords?"

"They put their ship down on the old imperial parade grounds. It's an awful big thing—I've seen it. A big ball made out o' metal, as big across as the mouth o' the river. I couldn't hardly believe m' eyes."

"Did you see any of the Skylords?"

"No. But I've heard that they're things about the size of a man, with red bodies."

Suddenly it seemed to Hinsie that he just had to go see all this for himself—now!

"I think I'll go over to the parade grounds and look the thing over," he said.

"O.K. if I come along?"

"Sure." So Hinsie and Thad MacArdle set out across the city. It was strange, Hinsie thought, to see Beston again after so long. The decayed old capital had scarcely changed. Walking along, he remembered scenes he had forgotten—a house where a friend had lived, a widening of the street where the children of the neighborhood had played. Those days were gone. They seemed like ancient history.

They climbed a ramp to the top of the city wall. From there they looked out across the weed-grown parade ground to the vessel of the Skylords. MacArdle's description had prepared Hinsie for the sight to a certain extent. It was still tremendously impressive. The ship was a sphere of bright metal, mountainlike in its bulk. It rose far above their fifty-foot vantage point on the wall. Clustered around the point where it rested on the ground, was a ring of metal legs, each as thick through as a man is tall, bracing it on every side.

"Gosh," Hinsie said. "This is worth it."

"Worth what?"

Hinsie hesitated, then decided that he could not trust the seaman with the secret of his escape from Breck. At least not yet. "Coming all this way to see it," he said.

"I don't know about all this," MacArdle said. "It sure has ruined bus'ness. Hardly anyone's doin' anything in the whole city. Nobody's shippin' anything out of the harbor. Just a few ships comin' in, that's all that's goin' on at the docks."

"What do most of the people in the city think about it?" Hinsie asked.

"They were scared, at first.

There was a regular riot when that thing came floatin' down out of the sky. I saw it. I was scared, too. But now—well, some think one way, others another. Some of 'em are all excited about goin' to heaven. Most of 'em are still scared, or at least don't like it."

A man came into view walking around from the far side of the metal sphere. He was dressed in close-fitting orange clothes. As he stood looking toward the city, the realization burned through Hinsie that this must be one of the Skylords.

"Look there!" MacArdle said.

Hinsie nodded silently and strained his eyes. His first impression had been right. The Skylord did look extraordinarily like a human being. Except for those clothes—

The manlike creature in the orange clothing kept staring toward the city. All of a sudden Hinsie had the dizzy thought that he was a religious rebel, a heretical skeptic, and was standing there only a few hundred feet from a god who *might* be paying personal attention to *him*. A scared feeling drained the strength from his arms and legs.

"Let's get out of here," he said.

They hurried down the ramp and into the streets of the city. "What's the matter?" MacArdle asked. "You get scared?"

"Yes," Hinsie said.

MacArdle helped Hinsie get a job at the docks. The first evening he was so utterly exhausted, so aching in joint and muscle, that he did not even think of continuing his search for facts. The next day was even worse. Hinsie wondered whether he could hold the job long enough to get the money he needed. After that, his body rose to the emergency, and he started to think about what he would do next.

He still wasn't fully over the scare he'd had. He felt sick each time he thought about going back to the ship of the Skylords. So he waited, and went on working.

The representatives from the different parts of Llorda had been arriving in the city for several days. Now the conference the Skylords had ordered took place. It turned out to be a short affair, over in one morning. Although there was a great crowd of people from the city gathered around the parade grounds to watch what was going on, Hinsie did not go. He was afraid. He had got himself into a fine mess. Probably by now the High Superior considered him hopelessly bad. He couldn't hope to keep his life if he were recaptured. Besides having run away, he was known to be a skeptic, possibly an atheist.

Eleven hundreddays earlier, Hinsie had been present at the execution of Athred the Apostate. He could still remember the monotheist's face, white but calm, as he was thrown alive into his grave, and the sight of the High Superior gloatingly supervising the men who shoveled dirt into it. He himself was not important enough to deserve a public execution to which

all of Llorda was invited, but his actions to date might earn him the punishment of burial alive just the same.

Another thought was that the Skylords had a notorious hatred for infidels. True, Hinsie thought that half at least of the things people said of the gods was the product of human imagination. Just the same, the story might be true.

All things considered, it might be best if he were to be on board the first ship to leave Beston harbor after the visit of the Skylords.

Around noon, Hinsie was lying in bed in the flophouse MacArdle had shown him to, resting drowsily. It was the midday rest period. The intermittent sound of a crier's whistle aroused him. He went over to the window and looked out. The crier came down the street.

Tweeeet! "The meeting of the Skylords with the people of Llorda is over!" *Tweeeet!* "The meeting with the Skylords is over! Listen all! The Skylords have finally come to restore us to our divine heritage. But the restoration will not be at once. The Lords of the universe have given us a while to close up our affairs in this world. When another generation has passed, thirty or forty hundred-days from now, they'll come back and once and for all restore us to heaven." *Tweeeet!* "Listen all!"

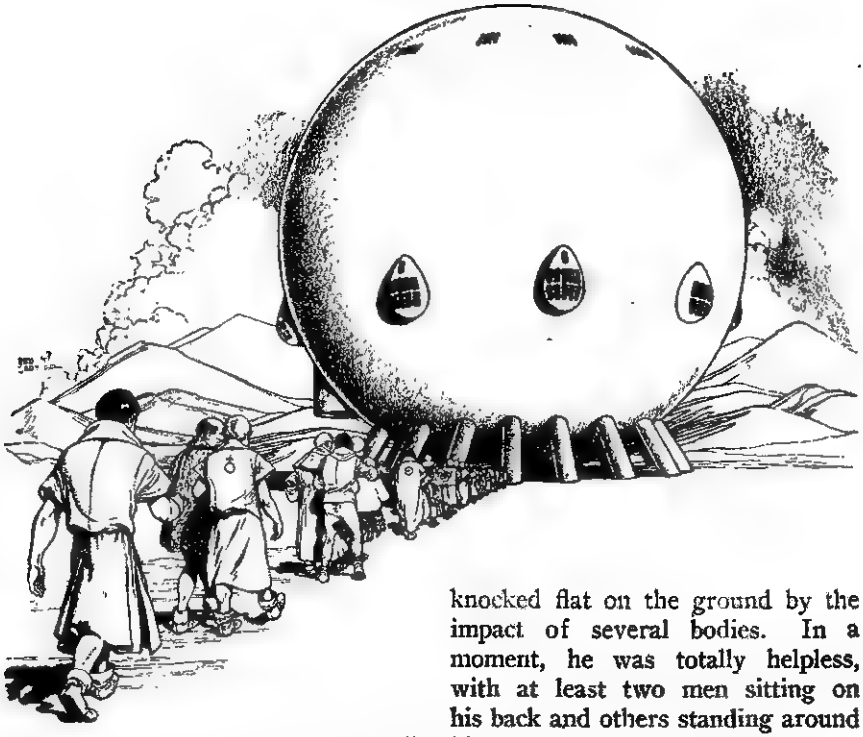
Hinsie ran downstairs and pushed his way through the crowd that was following the crier. He got close enough to hear what the man was saying.

. . . return to heaven, they will take with them one hundred mortals! Any of us has a chance to be chosen. If you want to go, and if your soul is free from evil-doing just go to the imperial parade grounds. The Skylords will take a hundred mortals. You may be one! If you want to be, go to the imperial parade grounds." *Tweeeet!* "Listen all!"

Hinsie stood in the street, excitement blazing through him. What a chance! He had dreamed of some day finding *for certain* what that ancient barrier to human understanding, the sky, really was. But he had never hoped for a chance like this. A hundred generations of men had lived and died under that perpetual gray barrier, never knowing what lay above it. Probably no living mortal knew. And this—!

He brushed aside the possibility that he was heading into trouble. This was worth life itself. He hurried across the city. There were crowds of people hurrying in the same direction. He thought in agony that one hundred was a terribly small number compared to the hordes who were going to apply.

He was surprised, as he went through the city gate, at the small number of people actually out on the field. There were masses of them standing outside the walls watching, but comparatively few out on the parade grounds where the Skylords and their metal ship were. A metallic maze surrounded the foot of the ship.



He paused uncertainly. "Say," he said to a man who was standing near the gate, watching, "what's going on out there?"

"They've got some stuff put up," the man said. "The people that want to go to heaven go in there. Some Skylords are there, but I haven't been able to see what they're doing."

"Are you going to try to get in?" Hinsie asked.

"Me? No! I'm not going off into the sky to Tuyl knows where in that thing. Not me!"

Hinsie shrugged and started across the field toward the sphere of metal. Suddenly he was knocked flat on the ground by the impact of several bodies. In a moment, he was totally helpless, with at least two men sitting on his back and others standing around him.

"Well, Mr. Hinsie," said the voice of the High Superior of Breck, "I guess we've finally found you. Another few minutes and you'd have really turned things upside down. To think that I was actually deceived by your pretense of reform." He sighed. Then: "Let him up, but hold his arms. We'll find a guard station in the city where we can leave him, and then we'll come back here and see about getting into heaven."

It was red-headed Osler who had hold of Hinsie's right arm, as the novices of the High Superior hustled him back through the gate into the city. "I told you you'd

get yourself into trouble," he said, and twisted Hinsie's arm further.

"There's a guard station just down this street," another of the novices said.

Hinsie felt sick clear through. Here was the end of his hopes. The end of his chance to find the answers to the old questions. Probably the end of his life. These people wouldn't let him escape a second time. Oh, why had he ever joined that monastery.

Suddenly furious, he jerked his arms loose and knocked the High Superior in front of him flat on the pavement. Surprised to find himself momentarily free, he broke into a run, the novices at his heels. By the time he had reached the next corner, his thoughts had cleared. He went around the corner and down the street toward the waterfront. Everyone along the way stared at the chase, but no one interfered.

If it had been two blocks farther, he wouldn't have made it. As it was, he trotted panting down a dock, only one of the novices in close pursuit. At the end of the dock, without pausing, he dove into the water and started swimming. After a few strokes, he looked back and saw the novices standing on the end of the dock, helpless with rage and exhaustion. From inland, they probably didn't know how to swim.

Then he noticed that one of them *was* in the water, coming after him. He saw a wet mass of red hair moving through the water. That jinx, Osler! Hinsie started stroking again. He got a mouthful of water and choked. That tiring run hadn't left him in any condition to swim half a mile across this neck of the harbor. He managed to make slow progress.

Suddenly he noticed a bireme coming down the harbor toward him. He swam to intersect its path. For an instant there were creaking sounds and flashing wet oar blades over his head. Then he caught hold of the rudder post and held on with every bit of strength he had. He looked back and saw Osler floundering in open water.

He had another chance.

Hinsie didn't waste any time. He hurried back to the parade grounds as fast as he could walk, his tunic still dripping wet.

At that, the people from Breck got there before him. They were waiting by the gate, waiting for him to try again. He intended to!

But not directly. He couldn't force his way past them. But he knew the city better than they did. He went half a mile across town and left the city through another gate, then made a circuit outside the wall back to the parade ground. There was a tremendous crowd of people there, watching what was going on. But still, there were not so many actually out on the field, under the bulk of that great metal sphere. Maybe he still had a chance.

If he didn't, there would be monastic blood splattered on the pavement before nightfall.

Hinsie walked out onto the field. Around the ship, there was a pattern

of enclosures walled by cunningly woven metal wire. Two orange-painted posts about ten feet high plainly marked the gate. A couple of Skylords were standing there, watching the people who came in.

At a distance of a few feet, they looked extraordinarily like ordinary human beings dressed in orange clothes.

There were a lot of people waiting in the first section of the enclosure. More than a hundred. Skylords kept coming to the gate that led to the next section and taking people out of this one. There was considerable jostling for positions near the gate.

After what seemed a horribly long time, Hinsie got through the gate, under the charge of a Skylord. "Come this way," he told Hinsie in a voice that sounded strange, an unfamiliar accent. Hinsie felt weak. The muscles of his arms were quivering.

"Can you read?" the Skylord asked.

Hinsie felt stunned. That line of questioning would lead to his connection with the monastery. And he dared not lie—not to a Skylord.

"I can read," Hinsie said.

"Where did you learn?" Well, there it was.

"In Breck Monastery, a few miles from here," he said.

The Skylord showed no sign of surprise. He simply asked, "What have you read?"

"All sorts of things. Theology, of course, and history and philosophy."

"So you've read history. Tell me what was happening on this island, uh . . . five hundred hundreddays ago."

Hinsie told him, in considerable detail and talking freely once he had warmed to the subject, of the civil wars and foreign battles and depraved emperors which had led to the collapse of the Llordan empire. As he went on, the Skylord began to look pleased. He finally held up his hand to stop.

"That's enough," he said. "You seem to be a rather well-informed young man." Hinsie felt his cheeks warm.

Another Skylord came up and said something in a strange language to the first one. There was a brief exchange, and then the Skylord who had interrupted pointed back in the crowd. Hinsie looked that way. The High Superior of Breck and his companions were standing in the first section of the wire enclosure, looking at *him*.

It didn't affect him. He had been running away from those people and fearing them for so long that this final piece of bad luck didn't arouse him emotionally at all. He just turned wearily to the two Skylords and waited.

The one who had been questioning him before said, "Your name is Hinsie?"

"Yes," he sighed.

"You seem to have got into a little trouble with those people over there."

Hinsie nodded. It was mildly interesting to speculate as to what they would do with him. They

might turn him over to the monastics, or they might dispose of him themselves.

Probably it would be the latter.

"You've been a skeptic and have doubted the truth of what they told you?"

Hinsie nodded again.

"In that case," the Skylord said, "you're just the kind of person we want. Come along!"

They stopped beneath the door that led up into the ship. Light was pouring down from within the ship, bright in the gloom of the ship's shadow. The Skylord looked at Hinsie and suddenly laughed. "Stop looking so sick," he said. "You're not going to get hurt. No! I mean it! You've been accepted as one of the hundred, that's all."

"But . . . what about the High Superior? The people from Breck?" Hinsie was confused.

"We don't want their kind," the Skylord said. "They wouldn't be able to grasp the reality of the universe outside this world's air envelope. We want people like you, who will adapt easily to new knowledge, and who also know enough about this world to give us the information we'll need in our plan of recivilization. We don't intend to plant a base here blind—with no knowledge of the cultural forces that are in action." He smiled.

"Don't worry, boy," he said. "You'll be all right. Now just go up that ramp. They'll take care of you inside the ship."

A day later, Hinsie saw the stars.

THE END.

THE ANALYTICAL LABORATORY

With short space available this month—it's a crowded issue this time—the Lab will simply report:

October 1947 Issue

Place	Story	Author	Points
1.	Ole Doc Methuselah	René Lafayette	2.32
2.	The End Is Not Yet (3)	L. Ron Hubbard	2.58
3.	Target	Peter Cartur	3.04
4.	Problem In Solid	George O. Smith	3.2
5.	Collector's Item	Frank B. Long	3.6

"Ole Doc" I'd classify as fun rather than cerebral science-fiction—and its position testifies that any type of science-fiction, well done, will take a first place!

THE EDITOR.

***Perhaps** the second greatest advance science made during the war was the full-scale development of servomechanisms. A simple machine, a bow, a waterwheel or a locomotive, has to be controlled. A second-stage machine controls itself, as a radar gun-layer will seek it's target and then* hold itself pointed on that moving target. *This is a basic advance comparable in importance to the atomic bomb itself.*

SERVOMECHANISMS

BY LORNE MACLAUGHLAN

A great many widely different devices may be classified as servomechanisms—devices as different in design and purpose as the automatic pilot, the thermostatically controlled house-heating system, and the atomic pile. Until recently no single name had been agreed upon, and few people even realized that all these devices belonged in a single class. Yet, once an example of a servomechanism is given and the principle explained, any modern machine-minded mortal nods his head and says yes, of course—he knew what it was all along!

Perhaps the reason we all feel so quickly familiar with the servomechanism is because our bodies incorporate many such devices, such as the ones which are continually in operation to hold our temperature and blood balance constant. Man is essentially a walking servomechanism, or he would fall flat on his face. Then, too, the human agency may form a part of a servomechanism. The driver and his car, the pilot plus aircraft, or the juggler and his knives are all servomechanisms. Thus one mathematician, in writing on this subject, opens his highly mathematical treatise by suggesting that Adam plus a well-balanced club

may well have formed part of a servomechanical control which kept the vocal output of Eve within a certain range.

In modern engineering practice we find that the art of analysis and more particularly of synthesis of servomechanisms is horribly complicated, the more so because the applications are so many and varied. The simplest man-made servo—short for servomechanism—may have differential equations which only a million dollar differential analyzer or electromechanical brain can solve. The many different techniques and individual components used by servo engineers are highly complex and ingenious.

All this should serve to dispel any notion one might have that the servo is just an important bit of gadgetry. It *is* important, but it is *not* a specific gadget or even, as the name might imply, a mechanism. *It is a way of doing things.* Usually an engineer wants to control something, such as the speed of a motor, the frequency of a radio transmitter, or the rate of chemical reaction in a solution. Even if he builds a static structure, such as a bridge, he wants it to stay put. If his control device is to be automatic, there are just *two* possible general methods.

One method is the *open-cycle* type of control. A house-heating system would have this type of control if the furnace were turned on regularly for ten minutes out of every hour by some time-operated switch. The traffic lights at intersections are often on open-cycle control, turning relentlessly red as impatient drivers honk and fume.

The other method is the *closed-cycle* or *servomechanical* type of control. Applied to a house-heating system it requires some measuring device which compares the temperature of the air with the temperature the thermostat is set for. As soon as the room temperature drops a fraction of a degree below the desired temperature an electric circuit is closed and the furnace is operated until the loss of heat is corrected. The same principle applied to traffic control requires vehicle detectors, which may be electromagnetic, to lengthen the green period in the direction of heaviest traffic.

Little reflection is needed to see that the second method of control is far superior. The first method, in the case of the furnace controller, makes no allowance for irregular losses of heat, or changes in the B.T.U. content of the fuel, so that we have no guarantee that it will give even a reasonable range of temperature variation. With the servo type of control a more or less continuous check is made to see that the results of the furnace operation are satisfactory. In other words, the output affects the input—we have a feedback system. Furthermore, we can change the thermostat setting, and the servo will at once set about maintaining the new temperature.

If we add the human element to the open-cycle controller, we can close the cycle. If our furnace does not have automatic thermostatic control, we can trot downstairs and

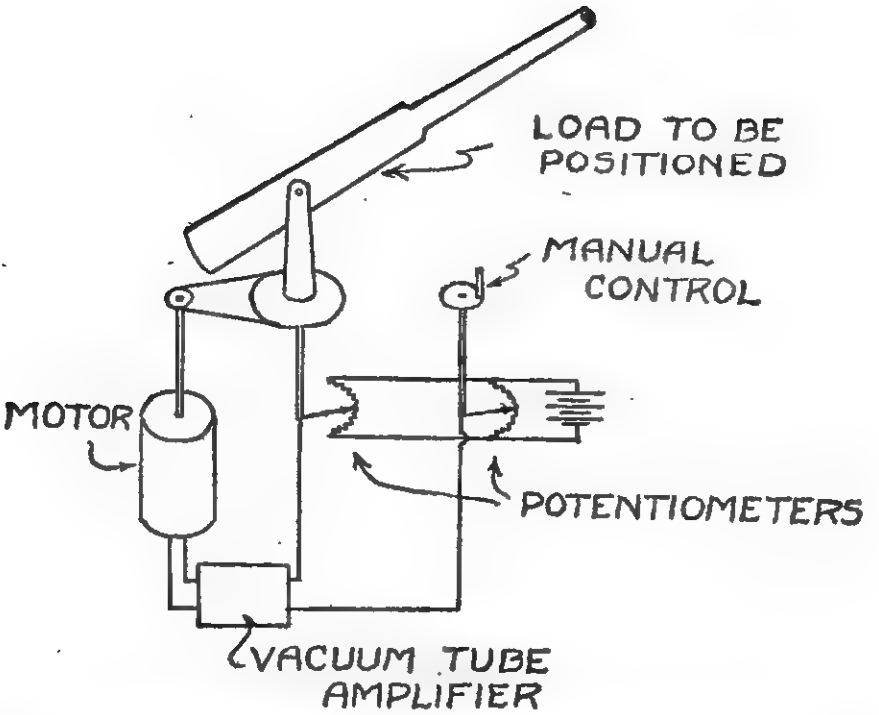


Figure 1. This is a simplified electromechanical circuit diagram for a position-control servomechanism. If the load to be positioned and the manual control indicator show the same angle, no voltage appears at the input. If one moves with respect to the other, an input signal appears at the amplifier, and it drives the motor to correct the discrepancy until the two are at the same azimuth angle again.

shut off the draft when we feel too warm, thus forming part of a servomechanism. Usually, however, the term is reserved for systems which are completely automatic.

The examples of servos which have been considered so far are for the most part rather crude, being of the discontinuous or "off-on" variety. Most of the better servos are continuous, and have an output which follows all input variations within reasonable limits. Thus if the furnace, in the example above, supplied heat at a rate directly proportional to the temperature difference, a "tighter" control of the temperature would be possible, with faster correction of serious changes, and a smaller tendency to overshoot the desired temperature value.

Many different kinds of circuit elements occur in servos, and we have already mentioned electrical, mechanical and thermal elements. To this list we must add hydraulic, sonic, and, finally, atomic elements. For the atomic pile is not a stable device—it definitely needs controlling. To be self-sustaining it must be held in the delicate balance between the condition where not quite enough extra neutrons are released by fission to make up for those which are lost, and the slightly more active condition where—THAT'S ALL, BROTHER.

In order to hold the atomic pile in a steady condition where its neutron output is at some desired level a servo incorporating a radiation detector, a motor and some cadmium rods is used. The voltage out of the radiation detector is compared with the voltage of a standard cell, and their difference is used to control the motor, which in turn pushes the cadmium rods into the pile, if the activity is too high, or withdraws them if it is too low. Other cadmium rods will drop into the pile when an electromagnet which holds them in place is de-energized, a necessary precaution in case of a power failure. The human agency is reserved for a last resort.

We can safely say that without the servomechanism the atomic pile would be impractical. True, the time-constant is greater than the reaction time of the average human. A trained operator might conceivably stand with one eye on a Geiger counter meter, and his hand on the control rheostat of the motor driving the cadmium rods—he might—but he would probably be all alone at his task. No one would trust such an arrangement for any length of time. The servo, really a single-minded robot, is faster and safer.

One reason for the greater trustworthiness of the servo lies in its simplicity. It is designed to do just one thing. Since it is incapable of sneezing at the wrong time, or of suffering from a hangover caused by nonessential activities we can be pretty sure that it will continue to perform its task as long as it has its food—usually in the form of electrical energy—and sufficient oil on its bearings. The servo may also have an advantage in speed over a human being. This is a matter of design in the case of the servo. Humans are not subject to much redesign, and their time-constants and range of power output are fixed by evolutionary processes in which the machine age has only begun to play a part.

The essential parts which go to make up a servomechanism might be better understood if we consider the gun positioning servo shown in Figure 1. Here we have a simplified version of the servo-controlled antiaircraft gun, with only the azimuth control shown. In it we have two electrical position-indicating devices, one of them a hand-controlled potentiometer, and the other a load-controlled potentiometer. The load which is to be positioned is, of course, the gun. The potentiometer is a mechanico-electrical transducer—it converts mechanical position

into electrical voltage by means of a slider and a resistor to which this slider makes contact. If the two potentiometers are in the same angular position, then the two wires leading from their sliders to the vacuum tube amplifier will be at the same electrical potential. Should their positions be different, there will be a potential difference, or voltage, which when fed into the vacuum tube amplifier will give an output current which will drive the motor so as to readjust the position of the gun to agree with the position of the manual control. When this is accomplished, the signal voltage fed into the amplifier drops to zero, and the motor stops. To be more precise, we should point out that as the gun is moved into position the voltage difference steadily decreases, so that the motor tends to slow down as it approaches its final position. In other words, the servo is linear.

One important feature in this, and in all servos, is that *the energy used to move the load does not come from the input signal,* but from some other source. In this case the energy is supplied, not from the hand-controlled potentiometer, but from the electrical power mains which feed the motor, and the amplifier power pack.

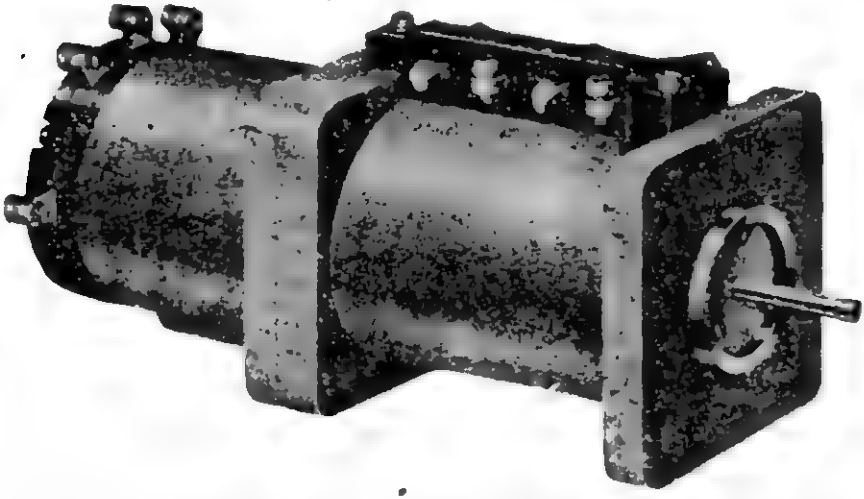
Another important feature in most servos is the use of transducers to convert one type of signal, which may be mechanical, hydraulic, "neutronic," or what-not, into another. Usually the conversion is to and from the electrical form. Electrical circuit theory is no more highly developed than mechanical circuit theory, for example, but the technique is easier. It is usually simpler to transmit a signal on a wire than on a rotating shaft, or by flow of gas in a pipe. In most cases then, transducers, such as tachometers, selsyns, or potentiometers—familiarly called "pots" by electrical engineers—are used in servos. Vacuum tube amplifiers amplify the electrical signal voltage, and circuits made of coils, condensers and resistors modify and shape it. Then, as in Figure 1 the signal may be converted into mechanical power by some such device as an electric motor.

This gun-positioning servo is a "follow-up" servo, or "power-booster" servo. A heavy load is positioned by the motion of a small potentiometer—there is a boost in power. In fact, this servo acts as a mechanical amplifier, with a feedback connection to insure accurate "following." In practice, the input signal, rather than being derived from a hand-controlled pot, may be the output signal of a fire-control radar. The radar might have a lobing antenna, pointing its beam now to the left, now to the right of the target, with its own servo to move its antenna so as to keep the target centered. This antenna movement, rather than the human hand, is used to move the input potentiometer, and thus keep the gun on the target. Since the reflected ultra-high-frequency power which returns to the radar antenna may be measured in micro-microwatts—millionths of a millionth of a watt, the total amplification from this power level to the point in the circuit where the gun-

positioning motor puts out kilowatts of power in mechanical form, is about 10^{15} times—a million billion times.

Another type of servo is the "zeroing" servo. Suppose that the load to be moved in Figure 1 is a directional radio antenna. Sometimes we may want to move the antenna so that it is beamed in a desired azimuthal direction, and then we have the "follow-up" type of servo discussed above. If the antenna must be held in a fixed position, despite gusts of wind and other disturbing influences, our servo is a "zeroing" servo. From Figure 1 it may be seen that an undesired motion of the load will put a signal into the amplifier, which will move the load back to its original position. Another zeroing servo is the fixed temperature bath used by biochemists to duplicate some of the conditions found in the human body when they experiment with enzymes, serums, and antibiotics. Here the servo must zero the temperature on 98.6° F. A popular method to achieve this is to use the mercury in the capillary tube of a special thermometer to make an electrical connection when the temperature of the bath drops due to heat loss. This connection, acting perhaps through relays or vacuum tubes, causes an electric heating element immersed in the bath to heat up and correct for the loss in heat.

So far, the operation of these servos seems simple and foolproof.



This photograph shows a servo-motor with a tachometer attached. More accurate control in a servo results if feedback from a tachometer generator is used as a sort of imitation electronic friction.

Kollsman Instrument Division of Square D Company.

A closer examination of the sequence of operations around the servo feedback loop, or better yet, a few experiments in servo design will bring some disillusionment. A primary source of trouble is the inertia of the load. A load such as the antiaircraft gun of Figure 1 has considerable mass. Inertia of a body with respect to an axis is a property which is dependent upon the mass of each part of the body, and the square of the distance of each part from the axis. It is the property of a flywheel which determines how long it will spin. The gun of Figure 1, if the servo loop gain or amplification is high enough, may be accelerated to such a velocity that its inertia, or flywheel effect, will carry it past the desired point when a correction is being made. After some initial overshoot, the gun may settle into the desired position—mechanical friction in the bearings will help us here. *Then again, it may not.* For, once it has gone past the right position, servo action reverses, or tries to reverse the motor. When this action succeeds in returning the motor towards the right position, enough velocity may be again attained to cause overshoot in the other direction. These overshoots may gradually die away, *or they may continue.*

This last condition is called "hunting," and the problem of avoiding such instability, or even excessive overshoots is the designer's chief problem. Let us examine some of the obvious solutions to this problem. If the use of too much gain in the amplifier, or too sensitive a motor is found to get the load up to speed too quickly, we might reduce this gain or sensitivity. This will cure the instability and overshoot troubles, but it will leave us with a servo which is sluggish and weak. Thus not only will errors in the load position be corrected slowly, but any extra friction in the bearings may halt the movement, leaving the load in the wrong angular position altogether.

Another cure for overshoot has been hinted at—we may increase the friction, and leave the amplifier gain at a high level. This must be paid for in the form of a larger motor to supply the extra energy which is converted into heat by the friction. A larger motor means more inertia —and more expense. More inertia means overshoot again, unless we add still more friction—need we go on? As a matter of fact some improvement may often be obtained by this method, but unless we call on the research engineer to design a more powerful motor with a smaller inertia, it is a rather crude method.

One of the servo designer's favorite tricks in a motor control servo is to use a kind of imitation friction —a kind of friction which slows down the load just like mechanical friction, but doesn't convert any energy into unwanted heat. Ordinary garden variety friction gives a back torque which is proportional to the speed of rotation. The imitation friction is supplied by a tachometer —really a tiny generator connected

to the motor shaft—which produces a *voltage* proportional to the speed. This voltage is fed back into the input to the motor, or of the amplifier driving the motor, and is so connected as to subtract from the voltage which is already there, and thus decrease the torque of the motor. Thus motor torque is not used up by this friction, but is canceled out, in part, before it really appeared. Since the amount of canceling-out is proportional to the speed, a reduction of overshoot can be obtained, but no increase in the size of the motor is needed.

This tachometer feedback is only one of the simplest of the many circuit devices used to improve servo designs. Shots in the arm will only give so much improvement in the human servo, and so it is here. The servo designer must get a pretty firm grip on the whole underlying theory if he wants to jazz his servo right up to the theoretical limit. If he is going to intelligently use the maximum possible amount of electromechanical benzedrine, he will get deeply into the study of circuit *synthesis*—the building up of circuits. This is intrinsically much more difficult than circuit *analysis*, for it is one thing to analyze a circuit, and quite another to say just how much better a circuit may be synthesized. Fortunately for the progress of servo design in World War II a method of analysis which was also applicable to problems of synthesis was already on the shelf. This method was one developed by Bell Telephone Laboratories engineers and mathematicians to enable them to deal with an important type of communication circuit which they had invented back in the thirties—the negative feedback amplifier.

Now the negative feedback amplifier is really a kind of all-electronic servo. The theory developed by Nyquist and others was based on the branch of mathematics known by the rather formidable title of "The Mathematics of the Complex Variable." This theory, carried over into the field of servo design during the war, gave fine results in the design of such devices as radar-controlled searchlights and anti-aircraft guns. But, Nature being what she is, even this method was found to have its limitations, because it only applies to *linear* systems. Thus if any of the tubes or motors in a servo are overloaded, the signal at one place in the loop will not be linearly related to that in another, and predictions as to accuracy and speed of response will not hold true. Of course designers try to avoid such difficulties by using the right size of motors and vacuum tubes in the right places. This can be a tricky business, because any element known to man will overload at some power level.

After getting rid of all possibilities of overload, we find that we can still have a meaner type of nonlinearity which appears at low signal amplitudes, if we have any mechanically moving parts in our servo. Backlash in gears belongs in this class, as well as "stiction" or static friction in bearings. Run-

ning friction is usually linear, that is, it demands a torque proportional to the velocity to maintain steady motion. The friction should be zero at zero velocity in keeping with this relation if we are to have linearity. But there is an added amount of friction—or stiction—which appears at very low speeds. Stiction is fine stuff to have between your car tires and the road—it is the added friction that you lose when your wheels begin to spin—but in a servo it is poison. At very low speeds, when the servo-motor has almost reduced the error to the zero value which is theoretically possible, stiction will stop the shaft.

If ordinary linear friction can be added to override stiction, fairly good linearity can be achieved. Tachometer feedback is just the ticket here. Since feedback loops of this kind are really servos themselves, we find the designer using servos within a servo to get the linearity which will enable him to correctly predict the results he will get.

Even this technique may leave the designer with a lot of work to do. Linear response of all the elements in a servo means linear differential equations, which are easier to handle than most kinds, but still difficult enough in many cases to tie up

The differential analyzer, invented by Dr. Vannevar Bush of M.I.T. played an important part in servomechanism research. This photo shows G. E.'s version, with three operators at the input tables.

General Electric Co.

an expert mathematician for a long time. Suppose, however, we have an element in the system which is "essentially" nonlinear, that is, one which is nonlinear over its whole range. An example might be a valve in a hydraulic servo, in which the relation between valve position and flow just isn't linear, and cannot be made linear. Add such an element to the servo, and you may tie up your mathematician for good *—unless you let him use a differential analyzer.*

It must be realized that the differential analyzer, which is rightly termed an electromechanical brain, can do nothing that the human brain cannot—it merely works faster. It can outwork several hundred experts, and is not prone to make slide-rule errors just before lunchtime. Included among the most important parts of its innards are

The servo-motors of the A-12 Gyropilot are normally used to move the controls in response to signals from the automatic pilot, but they may also be used to assist the human pilot in flying manually.

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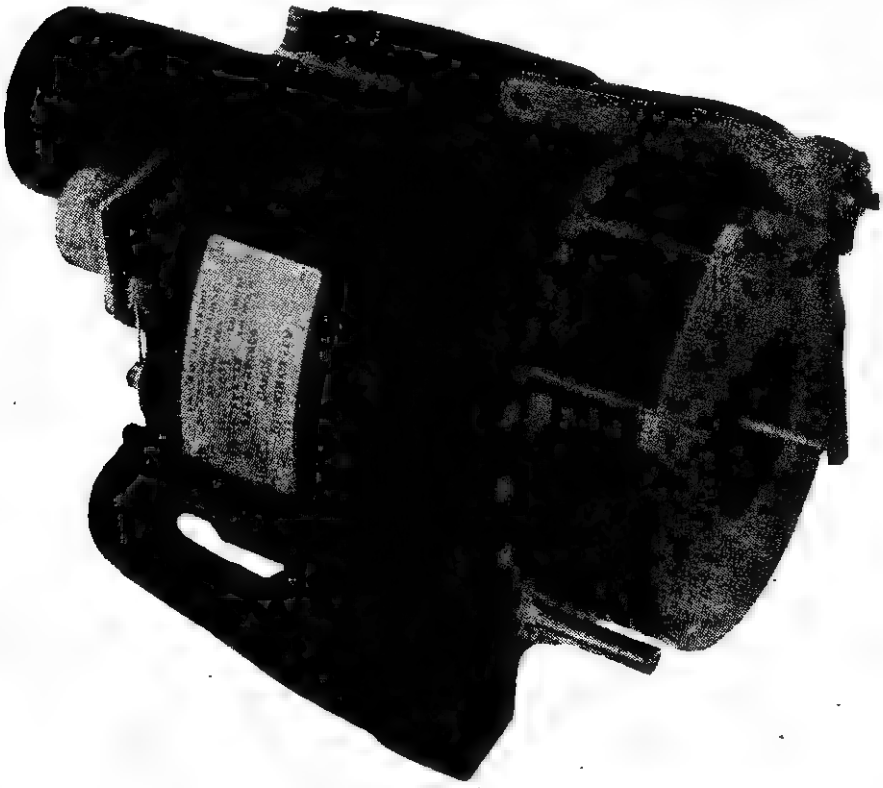

servomechanisms. This fact, that a machine full of servos is the best device for solving servo problems indicates as well as anything the universal importance of this class of devices.

Even with the differential analyzer highly trained men are needed to set the problems up and interpret the results. The machine itself is an interconnected system of shafts, motors, and gears, using mechanical elements for addition, subtraction, multiplication and division, and electromechanical elements for more complex functions. Removable gears and couplings must be re-arranged for each new problem. Linearly varying quantities can be fed in on an input shaft by varying its angular position in steady fashion. Non-linear quantities must be plotted up as a curve, which is followed by an operator at an input table, or by a servo-controlled photoelectric device. The result automatically appears as a curve, or series of curves, drawn by a mechanically operated pen. Newer machines are almost completely electronic, and are therefore faster and more compact.

One of the most important present and future uses of servomechanisms is in the automatic piloting of aircraft. As speeds are pushed up and up man's reaction time becomes inadequate, and as places get bigger his strength is insufficient. In fact it became obvious toward the end of the last war that man might well be eliminated as a wholly inadequate encumbrance in military aircraft. Even the single-minded Kamikaze pilot was inferior to the radar-controlled flying bomb known as the "bat." The last months of the air war in Europe saw valiant but ineffectual attempts by piloted aircraft to handle V-1s. Not even the attempt could be made in the case of the V-2.

The automatically piloted plane must maintain a predetermined air speed and attitude. The former is simple enough unless the air speed is to be that which gives greatest fuel economy, in which case it must be regularly varied. The attitude of a plane refers to the angular relation of the major geometrical axes of the plane to that of the earth. This is more complicated, even over short distances where great circle paths need not be considered, because there are three axes to consider. The plane must be equipped with three zeroing servos to remain in steady flight. One must adjust the elevators to prevent pitching, another adjusts the rudder to prevent yawing, and a third prevents rolling by adjustment of the ailerons. There must be some interconnection between the last two to give the proper amount of banking on the turns.

In Sperry's A-12 Gyropilot, for example, any deviation in attitude is detected by either of two gyroscopes. One, the Gyrosyn, compass, has its own axis horizontal. It responds to a change in azimuth by trying to tilt up or down. This signal operates the rudder servo-motor and the plane is swung back on the proper bearing. Another gyroscope has its axis vertical, and is used for both a pitch and a roll reference.

Two servos operate elevator and ailerons in accordance with signals from this gyro. The necessary coordination between the rudder and aileron servos to insure that the bank angle and rate of turn are in the ratio determined by the air speed is accomplished in the electrical circuits of these servos.

Still another servo is used to adjust the elevator trim tab. This servo operates when the main elevator servo is forced off-center by shifts in the center of gravity of the plane as fuel is consumed, or as passengers move about. Its continual automatic adjustment insures that the aircraft is ready for hands-off flight if the control should be switched from automatic to manual. Furthermore, trim-tab adjustment does for the elevator servo just what it does for the human pilot—leaves it centered and at ease, so that it can operate at maximum efficiency when suddenly called upon.

We will still find more servos such as the follow-ups used to send compass indications to different parts of the ship. Turbo-superchargers are servo-controlled—in fact a large modern plane may have as many as a dozen different servos.

One of the main advantages of the automatic pilot, its greater speed of control, shows up when the air is rough. A plane with a lot of inherent aerodynamic stability may be given its nose even in rough weather. The passengers will probably give their all. If the pilot works the controls, he may reduce irregular motions considerably, but it is hard work. The servo pilot, fast and tireless, will do a better job. Some graphs of yaw angle of a plane in rough air have been included here to show the superiority of the Sperry A-12 automatic pilot over a highly competent human pilot.

Dr. Louis N. Ridenour, writing in the *Atlantic,* tells a story of an automatic pilot that included a pigeon in the servo loop. Among the many weird ideas for more accurate bombing during the war was one in which a pigeon was trained to peck at the image of a bomb target and thus direct the bomb. When the bird pecked at an image which was off-center on the screen, electrical contacts were closed. The circuits, which were completed controlled motors which in turn operated the rudder and elevator of the flying bomb in which the bird was carried, kept it zeroed on the target.

Now such a servo as this, though fantastic to the point of absurdity, is possessed of all the usual components. The load to be controlled is the bomb. It is a zeroing type of servo, as we have already pointed out. It may be classed as biologic-electromechanical, and it seems likely that some of the transfer impedances involving the pigeon would be a bit hard to nail down. The error-measuring device is the poor pigeon, who rides for a fall, while pecking away at an image that he associates with the bird seed used to train him.

The servo designer in this case even had to overcome the usual troubles due to hunting. The pigeon just didn't peck fast enough to

Some of the main components of the A-12 Gyropilot are shown here. However, interconnections, such as those between the vertical gyro, the servo-amplifier, and the elevator servo-motor are not shown.

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make a sufficiently fine-grained signal. Initial experiments with marihuana were promising, but this method of time-constant reduction sometimes caused the error-detector to fall asleep, and open the servo loop. The lack of high frequency components in the signal from a single pigeon was finally overcome by simply using several pigeons, all

pecking away at once at separate images.

Dr. Ridenour has no data on the final outcome of all this research. He thinks, however, that this servo was brought to the stage where operational problems were being considered, when the atomic bomb rendered unnecessary such striving after increased accuracy.

Let us return to the ordinary pilot and ordinary types of aircraft. The modern aircraft design is pretty well threaded through by servo problems. We have spoken of the automatic pilot, so useful for steady flight. But what about the critical take-off and landing operations—are they not problems which can be solved by servo control? Of one thing we can be sure—human control is not sufficient. A very few cubic centimeters of water spread around an airport in the form of fog can render the most skillful pilot helpless.

Of course, this problem brings us smack up against one of the hottest controversies of modern aviation—G.C.A. (Ground Controlled Approach) versus I.L.S. (Instrument Landing System). In view of this controversy, it might be well to back off and take a long look at the situation, keeping well in mind what has been said about servomechanisms.

The basic fact about the servo to be kept in mind in the discussion of this and other applications is that it *can* be made to do a better job than a man *on the specific task for which it was designed*. No servo has yet been contemplated which approaches the human and his net of built-in servos in complexity of design and purpose. Thus we can expect that for some time to come we will be glad to have the human hand and brain ready to take over the controls when something unforeseen happens in any automatically piloted plane, whether landing or in steady flight.

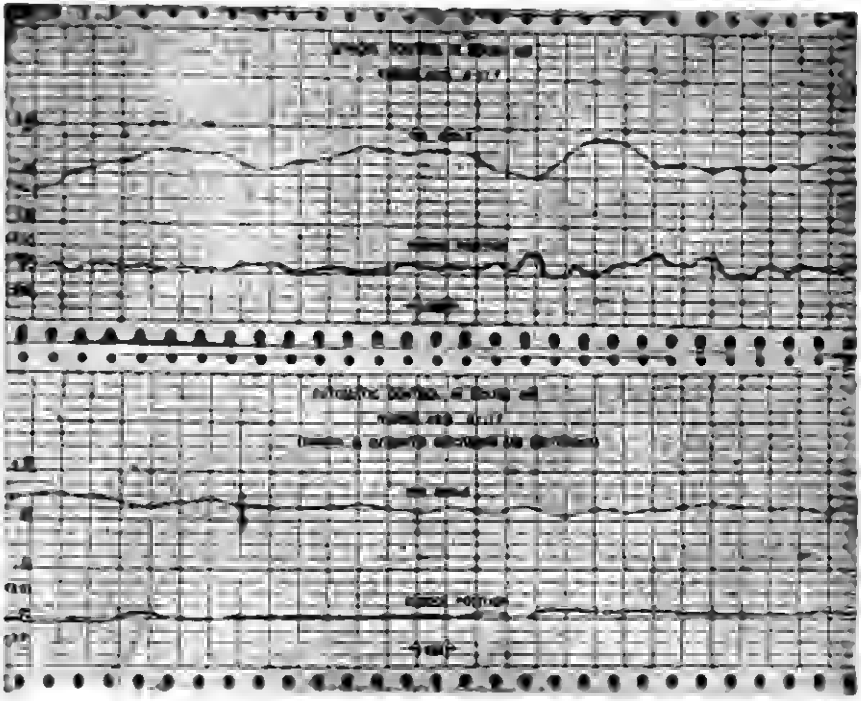
The I.L.S. system is not a servo until it is tied into an automatic pilot, such as the A-12 Gyropilot. It is merely a path, or beam of radio waves, which the special equipment in a plane can detect and enable the pilot to fly down the beam as though he were flying into a searchlight. Range markers et cetera are other necessary details.

In the past some criticism has been leveled at this system because the beam was too broad in the old V.H.F. — very-high-frequency — systems, and misleading reflections could be obtained from buildings et cetera. This criticism can now be disregarded, since microwave I.L.S. is available. For a given size of antenna, the beam width gets narrower, as frequency is increased, whether radar—as in G.C.A.—or point-to-point communication — as in I.L.S.—is used. Using microwaves, or ultra-high-frequencies, the beam widths are narrow enough to be satisfactory in either system.

Now the G.C.A. system is not a servo either, unless tied in to an automatic pilot. In this system a ground radar locates the plane, and the pilot is informed of his position with respect to a glide-path by ra-

dio. Although G.C.A. is not a servo, in this simple form, it may contain several servos—namely automatic azimuth, elevation and range trackers in the radar indicator. We might note in passing that in Gilfillan Bros. new G.C.A. radars these trackers are tricky affairs, incorporating electronic "gates" which move along with the signal to help insure that the tracker will not shift to some other plane than the desired one. The trackers even have velocity memory, to move the "gates" during any period when the signal cannot be distinguished from interference or "clutter."

So far it is not easy to do more than list a few points of superiority of one system or the other. Thus I.L.S. requires a bit more air-borne equipment, and G.C.A. quite a bit more equipment on the ground. I.L.S. does not provide as much insurance against collision in the air



Automatic recordings give a comparison between manual and automatic rudder control on a B-17F flying in turbulent air. The upper portion shows the record for a competent pilot, the lower for an A-12 Gyropilot. The faster-acting gyropilot gives less yaw angle variation by moving the rudder sooner, but less violently.

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with other ships trying to land at the same time, as does G.C.A.

Further comparisons could be added in great number, particularly if economic and psychological considerations are to be included. This is an argument for experts—experts who know last week's latest technical developments in each field. Since we are primarily interested in servos, let us consider the two systems for the case where each is tied in with an automatic pilot, by listing the equipment required in each system. We will find:

(1) An automatic pilot—both systems.

(2) Special air-borne receivers tied into the automatic pilot—both systems.

(3) A source of microwave power, on the landing field—both systems.

(4) A narrow microwave beam—fixed in I.L.S., scanned in G.C.A.

(5) A radar receiver on the ground—G.C.A. only.

(6) A transmitter on the ground to send messages to the receiver in the plane—G.C.A. only.

Broken down in this way, it would seem that the extra equipment needed in the G.C.A. system would mean that it would lose out in the completely automatic form. However, it gives the advantage that it could be used to talk down a plane equipped with only a simple receiver. Also, collisions over the field, as mentioned above, might be more easily avoided.

The whole situation begins to take a familiar pattern. Two good systems, each with undeniable advantages, have appeared in other fields of engineering. Thus we have the radio link versus coaxial cable controversy in communications. The result is usually that each system will live, and fit into its proper place as determined by economic and hard technical facts.

But even if an air-borne radar landing system—using special landing field reflectors—should replace both of the above systems, the future of the servomechanism is secure. Greater speed and size will call for more and more automatic control features. The air transport of the future will fly as though guided by steel rails, and land automatically, as though it were coasting down hill. This will be done with servos, and many of these servos will be designed with the aid of electromechanical brains with servos for synapses.

This is what the future—and not the too distant future—should bring. The last twenty years have seen more improvement in the speed and accuracy of servos than evolution has accomplished in the human in twenty thousand years. Twenty more years, barring accidents—particularly the kind of accidents engendered in servo-controlled atomic piles, and carried in servo-controlled devices moving at supersonic speeds—should bring that kind of exponential improvement in servos that we have seen in other electronic and mechanical devices.

THE END.

CHILDREN OF THE LENS

***Third** of Four Parts. In the last analysis, it is never simply power of metals and machines that counts— but power of mind against mind!*

BY E. E. SMITH

Illustrated by Rogers

When the inertialess drive was perfected and commerce throughout the Galaxy became commonplace, crime became so rampant as to threaten Civilization. Then came into being the Galactic Patrol, an organization whose highest members, the Unattached, or "Gray" Lensmen, are of unlimited authority and range. Each Lensman is identified by his Lens, a pseudoliving, telepathic jewel matched to the ego of its owner by the Arisians, a race of beings of unthinkable age and of corresponding power of mind. The Lens glows with color while worn by its owner, but kills any other who attempts to wear it.

Of all the eighteen-year-old boys of Earth, only a few each year win

through the five-year period of elimination and become Lensmen. Kimball Kinnison graduated Number One in his class and plunged immediately into the war with Boskonia, an abhorrent, dictatorial culture diametrically opposed to every ideal of Civilization. He and Worsel of Velantia, a winged, somewhat serpentlike reptilian Lensman, overcame the Overlords of Delgon. These creatures natives of the world nearest Velantia, had been preying upon the Velantians for ages, torturing them to death and feasting upon their life-forces. Wounded and sent to Base Hospital, Kinnison met and loved Sector Chief Nurse Clarrissa MacDougall, an auburn-haired beauty with unusual powers of mind.

Kinnison and Worsel guided the Grand Fleet of the Galactic Patrol in crushing the military strength of Boskonia, but the real heads of the enemy remained hidden. Kinnison went to Arisia for advanced training, acquiring the sense of perception and a superhypnotic ability to control the minds of others; which ability, however, could not work through a thought-screen. He became acquainted with Tregonsee of Rigel IV, a Lensman having the sense of perception instead of sight, an oil-drumlike body, and tentacular arms; also with Lensman Nadreck of Palain VII, a frigid-blooded poison-breather. These four, Kinnison, Worsel, Tregonsee, and Nadreck, were called Second-Stage Lensmen because they were the only ones then able to assimilate the extraordinary powers conferred by advanced Arisian training.

They found that Boskone's high command was in the Second Galaxy, and scouted it. Kinnison was captured, blinded, and tortured. His companions rescued him. His hands and feet had to be amputated, but Phillips, a Posnian surgeon, having completed his researches in hormonial neurology, caused new members to grow in place of those lost.

Civilization's Grand Fleet invaded the Second Galaxy and destroyed two headquarters planets; one with a negative-matter bomb of planetary antimass, the other by collision with planets placed in the inertialess condition, then inerted. Boskonia counterattacked; Tellus being saved by the "sunbeam", a concentration of all the energy of the sun into one beam.

One nameless Arisian, whom Kinnison spoke of as "Mentor", took an inexplicable interest in him. He never interfered, but would sometimes give the Lensman advice when asked via Lens. Kinnison and Clarrissa, thinking that the war was over, decided to marry; but were stopped by Mentor. They had more work to do first.

Boskonia was again attacking, with an entirely different technique. The Big Four discovered that Lyrane II, a planet of matriarchs, was a key. Since the matriarchs would not co-operate with any males or with nonhuman entities, Kinnison obtained Mentor's permission and assistance in making Clarrissa a Second-Stage Lensman. A cavern of Overlords upon Lyrane II was

found and destroyed; and upon Lyrane VIII a base of the Eich, a race of frigid-blooded, poison-breathing, pseudo - fourth - dimensional monsters—somewhat akin to the Palainians—who developed and regularly used the hyperspatial tube. By capturing some of the Overlords and Eich and reading their minds, they learned that the Boskonian commanders were Kandron of Onlo, an Eich-like creature, and the human-type Alcon, the Tyrant of Thrale.

Kinnison took the personality of Traska Gannel, an officer of Alcon's guard, enforcing his imposture by power of mind. He killed Alcon and usurped his place; then killed one Fossten, ostensibly Alcon's Prime Minister—aided, without his knowledge, by Mentor of Arisia. Apparently human, because of his immense hypnotic powers, Fossten was actually an Arisian-like creature. Mentor made Kinnison believe that Fossten was an Arisian who had gone mad in his youth.

Now the Tyrant of Thrale, Kinnison turned the planet over to the Patrol. Nadreck penetrated Onlo's defenses by stealth and skill, and by hypnotic and psychological means forced the defenders to kill each other. Peace came. Kinnison married Clarrissa. Twenty-odd years passed.

The Kinnisons had five children: one son, Christopher, and two pairs of identical-twin daughters one year apart—Kathryn, Karen, Camilla, and Constance. These children were prodigies of a new and startling kind; the Ultimates of Civilization.

Mental ills spread abroad. The Second-Stage Lensmen deduced that Boskonia was still trying to destroy Civilization; this time by the direct use of superpowerful minds. They went back to work, each in his own way. Worsel hunted Overlords; Tregonsee and Camilla sought the "X" that was perpetrating a certain type of crime; Nadreck lay in wait for Kandron, ex-ruler of Onlo.

Kinnison was abducted via hyperspatial tube. Kathryn followed along the tube and, without revealing herself, helped her father win. Kinnison learned, from a broken-down meteor miner named Eddie, that the Boskonians also had Lensmen, and that the matriarchs of Lyrane were in some way involved. He set out to find a Boskonian Lensman.

Kathryn had a minor engagement with a summer-form Plooran. Worsel and Constance conquered an outpost of the Eich, but encountered a thought-weapon that they could not trace or define. Nadreck set another trap for Kandron; and Karen could not interest him in the winter form of Plooran life.

Mentor gave Kit his final treatment. Clarrissa went to Lyrane II to find out what the matriarchs were doing. Kinnison became Brädlow Thyron, an outlaw drug-runner, and visited the office of Harkleroy, a drug baron on the planet Phlestyn II. Harkleroy attacked him, and in the battle was killed by his own men.

At Kinnison's signal the Dauntless *had landed; and as the Gray Lensman begins to fight his way out of Harkleroy's fortress, Major Peter*

VonBuskirk and a battalion of Valerian axmen begin to fight their way in.

Part 3

XV.

Inch by inch, foot by foot, Kinnison fought his way back along the corpse-littered corridor. Under the ravening force of the attacker's beams his defensive screens flared into pyrotechnic splendor, but they did not go down. Fierce-driven metallic slugs spanged and whanged against the unyielding dureum of his armor, but that, too, held. Dureum is incredibly massive, unbelievably tough, unimaginably hard—against these qualities and against the thousands of horsepower driving that veritable tank and energizing its screens the zwilniks might just as well have been shining flashlights at him and throwing confetti. His immediate opponents could not touch him, but the Boskonians were bringing up reserves that he didn't like a little bit; mobile projectors with whose energies even his screens could not cope.

He had, however, one great advantage over his enemies. He had the sense of perception; they did not. He could see them, but they could not see him. All he had to do was to keep at least one opaque wall between them until he was securely behind the mobile screens, powered by the stupendous generators of the *Dauntless*, which VanBuskirk and his Valerians were so earnestly urging toward him. If a door was handy in the moment of need, he used it. If not, he went through a wall.

The Valerians were fighting furiously and were coming fast. Those two words, when applied to members of that race, mean something starkly incredible to anyone who has never seen Valerians in action. They average little less than seven feet in height; something over four hundred pounds in weight; and are muscled, boned, and sinewed against a normal gravitational force of almost three times that of Earth. VanBuskirk's weakest warrior could do, in full armor, a standing high jump of fourteen feet against one Tellurian gravity; he could handle himself and the thirty-pound monstrosity which was his space-ax with a blinding speed and a devastating efficiency literally appalling to contemplate. They are the deadliest hand-to-hand fighters ever known; and, unbelievable as it may seem to any really highly advanced intelligence, they did and still do fairly revel in that form of combat.

The Valerian tide reached the battling Gray Lensman—closed around him.

"Hi . . . you little . . . Tellurian . . . wart!" Major Peter VanBuskirk boomed this friendly thought, a yell of pure joy, in cadence with the blows of his utterly irresistible weapon. His rhythm broke—his frightful ax was stuck. Not even dureum-inlaid armor could bar the inward course of those furiously driven beaks; but sometimes it made it fairly difficult to get them out. The giant pulled, twisted

—put one red-splashed boot on the battered breastplate—bent his mighty back—heaved viciously. The weapon came free with a snap that would have broken any ordinary man's arms, but the Valerian's thought rolled smoothly on: "Ain't we got fun?"

"Ho, Bus, you big Valerian baboon!" Kinnison thought back in kind. "Thought maybe we would need you and your gang—thanks for the ride. But back, now, and fast!"

Although the Valerians did not like to retreat, after even a successful operation, they knew how to do it. Hence in a matter of minutes all the survivors—and their losses had been surprisingly small—were back inside the *Dauntless*.

"You picked up my speedster, Frank." It was a statement, not a question, directed at the young Lensman standing beside the Chief Pilot's board.

"Of course, sir. They're massing fast, and without any hostile demonstration, as you said they would." He nodded unconcernedly at the plate, which showed the sky dotted with warlike shapes.

"No maulers?"

"None detectable as yet."

"QX. Original orders stand. At detection of one mauler, execute Operation Able without further instructions. Tell everybody that, while the announcement of Operation Able will put me out of control instantly and automatically, until such announcement I will give instructions. What they will be like I haven't the foggiest notion. It depends on what His Nibs upstairs decides to do—it's his move next."

As though the last phrase were a cue, a burst of noise rattled from the speaker—of which only the words "Bradlow Thyron" were intelligible to the un-Lensed members of the crew. That name, however, explained why they were not being attacked—yet. Kalonia had heard much of that intransigent and obdurate pirate and of the fabulous prowess of his ship; and Kinnison was pretty sure that they were much more interested in his ship than in him.

"I can't understand you!" The Gray Lensman barked, in the polyglot language he had so lately learned. "Talk pidgin!"

"Very well. I see that you are indeed Bradlow Thyron, as we were informed. What do you mean by this outrageous attack? Surrender! Disarm your men, take off their armor, and march them out of your vessel, or we will blast you as you lie there—Mendonai, vice admiral, speaking!"

"I abase myself." Kinnison-Thyron did not sneer—exactly—and he did incline his stubborn head perhaps one millimeter; but he made no move to comply with the orders so summarily issued. Instead:

"What kind of planet is this, anyway?" he demanded, hotly. "I come here to see this louse Harkleroy because a friend of mine tells me that he's a big shot and so interested in my line that we can do a lot of business with each other. I give the lug fair warning, too—tell

him plain that I've been around plenty and that if he tries to give me the works I'll rub him out like a pencil mark. So what happens? In spite of what I just tell him he tries dirty work on me, and I go to work on him—which he certainly has got coming to him. Then you and your flock of little tin boats come barging in as though I'd busted a law or something. Who do you think you are, anyway? What license you got to be butting into a private business deal?"

"Ah, I had not heard that version." Vision came on; the face upon the plate was typically Kalonian—blue, cold, cruel, and keen. "Harkleroy was warned, you say? Definitely?"

"I warned him plenty definitely. Ask any of the zwilniks in that private office of his. Most of them are still alive, and they all must of heard it."

The plate fogged, the speaker again gave out gibberish. The Lensmen knew, however, that the commander of the cruisers above them was indeed questioning the dead zwilnik's guards. They knew that Kinnison's story was being corroborated in full.

"You interest me." The Boskonian's language again became intelligible to the group at large. "We will forget Harkleroy—stupidity brings its own reward and the property damage is of no present concern. From what I have been able to learn of you, you have never belonged to that so-called Civilization. I know for a fact that you are not, and never have been, one of us. How have you been able to survive? And why do you work alone?"

"'How' is easy enough—by keeping one jump ahead of the other guy, like I did with your pal here, and by being smart enough to have good engineers put into my ship everything that any other one ever had and everything they could dream up besides. As to 'why,' that's simple, too. I don't trust anybody except myself. If nobody except myself ever knows what I'm going to do, or when, nobody except myself is ever going to be able to stick a knife into me when I ain't looking—see? So far, it's paid off big. I'm still around, and still healthy, while them that trusted other guys ain't."

"I see. Crude, but graphic. The more I study you, the more convinced I become that you would be a worth-while addition to our force—"

"No deal, Mendonai," Kinnison interrupted, shaking his unkempt head positively. "I never yet took orders from no boss, and I ain't going to, never."

"You misunderstand me, Thyron." The zwilnik was queerly patient and much too forbearing. Kinnison's insulting omission of his title should have touched him off like a rocket. "I was not thinking of you in any minor capacity, but as an ally. An entirely independent ally, working with us in certain mutually advantageous undertakings."

"Such as?" Kinnison allowed himself to betray his first sign of interest. "You may be talking

sense now, brother, but what's in it for me? Believe me, there's got to be plenty."

"There will be plenty. With the ability you have already shown, and with our vast resources back of you, you will take more every week than you have been taking in a year."

"Yeah? People like you just love to do things like that for people like me. What do *you* figure on getting out of it?" Kinnison wondered, and Lensed a sharp thought to his junior at the board.

"On your toes, Frank. He's stalling for something, and I'm betting it's maulers."

"None detectable yet, sir."

"We stand to gain, of course," the pirate admitted, smoothly. "For instance, there are certain features of your vessel which might—just possibly, you will observe, and speaking only to mention an example—be of some interest to our naval designers. Also, we have heard that you have an unusually hot battery of primary beams. You might tell me about some of those things now; or at least refocus your plate so that I can see something besides your not unattractive face."

"I might not, too. What I've got here is my own business, and stays mine."

"Is that what we are to expect from you in the way of co-operation?" The commander's voice was still low and level, but now bore a chill of deadly menace.

"Co-operation!" The cutthroat chief was unimpressed. "I'll maybe tell you a thing or two—eat out of your dish—after I get good and sold on your proposition, whatever it is, but not one second sooner!"

The commander glared. "I weary of this. You probably are not worth the trouble, after all. I might as well blast you out now as later. You know that I can, of course, as well as I do."

"Do I?" Kinnison did sneer, this time. "Act your age, pal. As I told that fool Harkleroy, this ain't the first planet I ever sat down on, and it won't be the last. And don't call no maulers," as the Boskonian officer's hand moved almost imperceptibly toward a row of buttons. "If you do, *I* start blasting as soon as we spot one on our plates—and they're full out right now."

"*You* would start blasting?" The zwilnik's surprise—almost amazement—was plain, but the hand stopped its motion.

"Yeah—me. Them heaps of scrap metal you got up there don't bother me a bit, but maulers I can't handle, and I ain't afraid to tell you so because you probably know it already. I can't stop you from calling 'em, if you want to, but bend both ears to this—I can outrun 'em, and I'll guarantee that you personally won't be alive to see me run. Why? Because your ship will be the first one I'll whiff on the way out. And if the rest of your heaps stick around long enough to try to stop me, I'll whiff twenty-five or thirty more of them before your maulers can get close enough so that I'll have to flit. Now, if your brains are made out of the same

kind of thick, blue mud that Harkleroy's was, start something!"

This was an impasse. Kinnison knew what he wanted the other to do, but he could not give him a suggestion, or even a hint, without tipping his hand. The officer, quite evidently, was in a quandary. He did not want to open fire upon this tremendous, this fabulous ship. Even if he could destroy it, such a course would be unthinkable—unless, indeed, the very act of destruction would brand as false rumor the tales of invincibility and invulnerability which had heralded its coming, and thus would operate in his favor at the court-martial so sure to be called. He was very much afraid, however, that those rumors were not false—a view which was supported very strongly both by Thyron's undisguised contempt for the Boskonian warships threatening him and by his equally frank declaration of his intention to avoid engagement with craft of really superior force. Finally, however, the Boskonian perceived one thing that did not quite fit.

"If you are as good as you claim to be, why aren't you doing a flit right now?" Mendonai asked, smoothly. "If you could get away, I should think that you'd be doing it. We've got stuff, you know, that's both heavy and fast."

"Because I don't *want* to flit, that's why. Use your head, pal." This was better. Mendonai had shifted the conversation into a line upon which the Lensman could do a bit of steering. "I had to leave the First Galaxy because it got too hot for me, and I got no connections at all, yet, here in the Second. You folks need certain kinds of stuff that I've got, and I need other kinds, that you've got. So we could do a nice business, if you wanted to. That was what I had in mind with Harkleroy, but he got greedy. I don't mind saying that I'd like to do business with you, but I just got bit pretty bad, and I'll have to have some kind of solid guarantee that you mean business, and not monkey business, before I take a chance again. See?"

"I see. The idea is good, but its execution may prove difficult. I could give you my word, which I assure you has never been broken."

"Don't make me laugh." Kinnison snorted. "Would you take mine?"

"The case is different. I would not. Your point, however, is well taken. How about the protection of a high court of law? I will bring you an unalterable writ from any court you name."

"Uh-huh," the Gray Lensman dissented. "There never was no court yet that didn't take orders from the big shots who kept the fat cats fat, and lawyers are the crookedest crooks in the whole Universe. You'll have to do better than that, pal."

"Well, then, how about a Lensman? You know about Lensmen, don't you?"

"A Lensman!" Kinnison gasped. He shook his head violently. "Are you completely nuts, or do you think I am? I *do* know Lensmen—a

Lensman chased me from Alsakan to Vandemar once, and if I hadn't had a dose of Hell's own luck, he'd have got me. Lensmen chased me out of the First Galaxy—why else do you think I'm here? Use your brain, mister, use your brain!"

"You're thinking of Civilization's Lensmen — particularly of Gray Lensmen." The officer was manifestly enjoying Thyron's passion. "Ours—the Black Lensmen—are different—entirely different. They have as much power, or more, but they use it as it should be used. They work with us right along. In fact, they have been bumping Gray Lensmen off right and left lately."

"You mean that he could open up, for instance, your mind and mine, so that we could see that the other guy wasn't figuring on running in no stacked decks? And that he'd stand by and sort of referee this business deal we got on the fire? And do you know one yourself—personally?"

"He could, and would, do all that. Yes, I know one personally. His name is Melasnikov, and his office is on Kalonia III, not an hour's flit from here. He may not be there at the moment, but he will come in if I call. How about it—shall I call him now?"

"Don't work up a sweat. Sounds like it might work, if we can figure out an approach. I don't suppose that you and him would come out to me in space?"

"Hardly. After the way you have acted, you wouldn't expect us to, would you?"

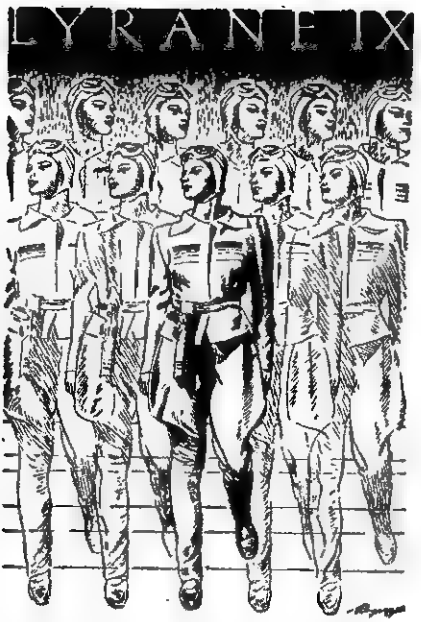
"It wouldn't be very bright of you. And since I want to do business, I guess I got to meet you part way. How would this be? You pull your ships away, out of range. My ship takes station right above this here Lensman's office. I go down in my speedster, like I did here, and go inside to meet him and you. I'll wear my armor—and when I say it's real armor I ain't just snapping my choppers, neither."

"I can see only one slight flaw." The Boskonian was really trying to work out a mutually satisfactory solution. "The Lensman will open our minds to you in proof, however, that we will have no intention of bringing up our maulers or other heavy stuff while we are in conference."

"Right then he'll show you that you hadn't better, too." Kinnison grinned, wolfishly.

"What do you mean?" The officer demanded.

"I mean that I've got enough good big superatomic bombs aboard to blow the planet apart, and that the boys'll drop 'em all if you start playing dirty. I've got to take a little chance, of course, to start doing business, but it's a small one. If you ain't smart enough to know that what would happen would be mighty poor business, your Lensman will be—especially when it won't get you any dope on what makes this ship of mine tick the way she does. And the clincher is that even if you bring up everything you've got, I never did figure on living forever, and going out in an atomic blast of that size, together with your fleet and half your



planet and you and your Lensman and seven hundred million other people, is as good a way as I can think of."

"If the Lensman's examination bears that out, it will constitute an absolute guarantee," the officer agreed. Hard as he was, he could not conceal the fact that he had been shaken: "Everything, then, is satisfactory?"

"On the green. Are you ready to flit?"

"We are ready."

"Call your Lensman, then, and lead the way. Boys, take her upstairs!"

XVI.

Karen Kinnison was worried. She, who had always been so steady, so sure of herself, had for weeks been conscious of a gradually increasing . . . what was it, anyway? Not exactly a loss of control . . . a *change* . . . a something that manifested itself in increasingly numerous fits of senseless—sheerly idiotic—stubbornness. And always and only it was directed at—of all the people in the universe—her brother. She got along with her sisters perfectly; their tiny tiffs barely rippled the surface of any of their minds. But any time her path of action crossed Kit's, it seemed, the profoundest depths of her being flared into opposition like exploding duodec. Worse than senseless and idiotic, it was inexplicable, for the feeling which the Five had for each other was much deeper than that felt by ordinary brothers and sisters.

She didn't want to fight with Kit. She *liked* him! She liked to feel his mind *en rapport* with hers, just as she liked to dance with him; their bodies as completely in accord as were their minds. No change of step or motion, however suddenly conceived and executed or however bizarre, had ever succeeded in taking the other by surprise or in marring by a millimeter the effortless precision of their performance. She could do things with Kit that would tie any other man into knots and break half of his bones. All other men were lumps. Kit was so far ahead of any other man in existence that there was simply no comparison. If she were Kit she would give her a going-over that would . . . or could even he—

At the thought she turned cold inside. He could not. Even Kit,

with all his tremendous power, would hit that solid wall and bounce. Well, there was one—not a man, but an entity—who could. He might kill her, but even that would be better than to allow the continued growth within her mind of this monstrosity which she could neither control nor understand. Where was she, and where was Lyrane, and where was Arisia? Good—not too far off line. She would stop off at Arisia en route.

She did so, and made her way to Mentor's quiet office on the hospital grounds. She told her story.

"Fighting with Kit was bad enough," she concluded, "but when I start defying *you*, Mentor, it's high time that something was done about it. Why didn't Kit ever knock me into a spiral? Why didn't you work me over? You called Kit in, with the distinct implication that he needed more education—why didn't you pull me in here, too, and pound some intelligence into me?"

"Concerning you, Christopher had definite instructions, which he obeyed. I did not touch you for the same reason that I did not ask you to come to me; neither course would have been of any use. Your mind, daughter Karen, is unique. One of its prime characteristics—the one, in fact, which is to make you an all-important player in the drama which is to come—is a yieldlessness very nearly absolute. Your mind might, just conceivably, be broken; but it cannot be bent by any imaginable external force, however applied. Thus it was inevitable from the first that nothing could be done about the untoward manifestations of this characteristic until you yourself should recognize the fact that your development was not complete. It would be idle for me to say that during adolescence you have not been more than a trifle trying. I was not speaking idly when I said that the development of you has been a tremendous task. It is with equal seriousness, however, that I now tell you that the reward is commensurate with the magnitude of the undertaking. It is impossible to express the satisfaction I feel—the fulfillment, the completion, the justification—as you children come, one by one, each in his proper time, for final instruction."

"Oh—you mean, then, that there's nothing really the matter with me?" Hard as Karen was, she trembled as her awful tension eased. "That I was *supposed* to act that way? And can I tell Kit, right away?"

"No need. Your brother now knows that it was a passing phase; he shall know very shortly that it has passed. It is not that you were 'supposed' to act as you acted. You could not help it. Nor could your brother, nor I. From now on, however, you shall be completely the mistress of your own mind. Come fully, daughter Karen, into mine."

She did so, and in a matter of time her "formal education" was complete.

"There is one thing that I don't quite understand—" she began, before she boarded her speedster.

"Consider it, and I am sure that you will," Mentor assured her. "Explain it, whatever it is, to me."

"QX—I'll try. It's about Fossten and Dad." Karen cogitated. "Fossten was, of course, an Eddorian—your making Dad believe him to be an insane Arisian was a masterpiece. I see, of course, how you did that—principally by making Fossten's 'real' shape exactly like the one he saw of you in Arisia. But his physical actions as Fossten—"

"Go on, daughter. I am sure that your visualization will be sound."

"While acting as Fossten he had to act as a Thralian would have acted," Kay decided with a rush. "He was watched everywhere he went, and knew it. To display his real power would have been disastrous. Just like you Arisians, they have to keep in the background to avoid setting up an inferiority complex that will ruin everything for them. Fossten's actions, then, were constrained. Just as they were when he was Gray Roger, so long ago—except that then he did make a point of unhuman longevity, deliberately to put an insoluble problem up to First-Lensman Samms and his men. Just as you—you *must* have . . . you *did* coach Virgil Samms, Mentor, and some of you Arisians were there, as men!"

"We were. We wrought briefly as men, and died as men. Up to the present moment, no one has ever been the wiser."

"But you weren't Virgil Samms, please!" Kay almost begged. "Not that it would break me if you were, but even I would much rather you hadn't been."

"No, none of us was Samms," Mentor assured her. "Nor Cleveland, nor Rodebush, nor Costigan, nor even Clio Marsden. We worked with—'coached,' as you express it—those persons and others from time to time in certain small matters, but we were at no time integral with any of them. One of us was, however, Dr. Bergenholm. The full inertialess space-drive became necessary at that time, and it would have been poor technique to have had either Rodebush or Cleveland develop so suddenly the ability to perfect the device as Bergenholm did perfect it."

"QX. Bergenholm isn't important—he was just an inventor. To get back onto the subject of Fossten: When he was there on the flagship with Dad, and in position to throw his full weight around, it was too late—you Arisians were on the job. You'll have to take it from there, though; I'm out beyond my depth."

"Because you lack data. Know, then, daughter, that the planet Eddore is screened as heavily as is our own Arisia; by screens which can be extended at will to any desired point in space. In those last minutes the Eddorian knew that Kimball Kinnison was neither alone nor unprotected. He called instantaneously for help, but help did not come. It could not. Eddore's screens were being attacked at every

point by every force generable by the massed intellect of Arisia; they were compressed almost to the planet's surface. If the Eddorians had weakened those screens sufficiently to have sent through them a helping thought, every one of them would in that instant have perished. Nor could Fossten escape from the form of flesh he was then energizing. I myself saw to that." Karen had never before felt the Arisian display emotion, but his thought was grim and cold. "From that form, which your father never did perceive, he passed into the next plane of existence."

Karen shivered. "It served him right. That clears everything up, I think. But are you *sure*, Mentor, that you can't—or rather, shouldn't—teach me any more than you have? It's just about time for me to go, and I feel . . well, 'incompetent' is putting it very mildly indeed."

"To a mind of such power and scope as yours, in its present state of development, such a feeling is inevitable. Nor can anyone except yourself do anything about it. Cold comfort, perhaps, but it is the stark truth that from now on your development is your own task. Yours alone. As I have already told Christopher and Kathryn, and will very shortly tell Camilla and Constance, you have had your last Arisian treatment. I will be on call to any of you at any instant of any day, to aid you or to guide you or to reinforce you at need; but of formal instruction there can be no more."

Karen left Arisia and drove for Lyrane, her thoughts in a turmoil. The time was too short by far; she deliberately cut her vessel's speed and took a long detour so that the vast and chaotic library of her mind could be reduced to some semblance of order before she landed.

She reached Lyrane II, and there, again to all outward seeming a happy, carefree girl, she hugged her mother rapturously. Nor was this part of it acting in any sense—as has been said, those four girls loved each other and their mother and their father and their brother with a depth and fervor impossible to portray intelligibly in words.

"You're the most *wonderful* thing, Mums!" Karen exclaimed. "It's simply marvelous, seeing you again in the flesh."

"Now why bring *that* up?" Clarrissa had—just barely—become accustomed to working undraped, in the Lyranian fashion.

"I didn't mean it that way at all, and you know I didn't." Kay snickered. "Shame on you—fishing for compliments, and at your age, too!" Ignoring the older woman's attempt at protest she went on: "All kidding aside, Mums, you're a mighty smart-looking hunk of woman. I approve of you exceedingly much. In fact, we're a keen pair, and I like both of us. I've got one advantage over you, of course, in that I never did care a particle whether I ever had a stitch of clothes on or not, anywhere, and you still do, a little. But what I was going to ask, though, was how are you doing?"

"Not so well—of course, though,

I haven't been here very long." Clarrissa, forgetting her undressedness, frowned. "I haven't found Helen, and I haven't found out yet why she retired. I can't quite decide whether to put pressure on now, or wait a while longer. Ladora, the new Elder Person, is . . . that is, I don't know— Oh, here she comes now. I'm glad—I want you to meet her."

If Ladora was glad to meet Karen, however, she did not show it. Instead, for an inappreciable instant of time which was nevertheless sufficient for the acquirement of full information, each studied the other. Like Helen—the former Queen of the matriarchy of Lyrane II,—Ladora was tall, beautifully proportioned, flawless of skin and feature, hard and fine. But so, and in most respects even more so, to Ladora's astonishment and quickly-mounting wrath, was this pink-tanned stranger. Practically instantaneously, therefore, she hurled a vicious mental bolt—only to get the surprise of her life. She had not yet crossed wills in a serious enough way with this strange person, Clarrissa, to find out what she had in the way of equipment, but it certainly couldn't be much. She had never tried to do her harm, nor ever seemed to resent her studied and arrogant aloofness; and therefore her daughter, younger and less experienced, of course, would be easy enough prey.

But Ladora's bolt, the heaviest she could send, did not pierce even the outermost fringes of her intended victim's defenses, and so vicious was the almost simultaneous counterthrust that it went through the Lyranian's hard-held block in nothing flat. Inside her brain, it wrought such hellishly poignant punishment that the matriarch, forgetting everything, tried only and madly to scream. She could not. She could not move a muscle of her face or of her body. She could not even fall. And the one brief glimpse she had into the stranger's mind showed it to be such a blaze of incandescent fury that she, who had never feared in the slightest any living creature, knew now in full measure what fear was.

"I'd like to give that alleged brain of yours a real massage, just for fun." Karen forced her emotion to subside to a mere seething rage, and Ladora watched her do it. "But since this whole stinking planet is my mother's dish, not mine, she'd blast me to a cinder—she's done it before—if I dip in." She cooled further—visibly. "At that, I don't suppose you're too bad an egg, in your own poisonous way—you just don't know any better. So maybe I'd better warn you, you poor fool, since you haven't got sense enough to see it, that you're playing with a live fuse when you push my mother around like you've been doing. About one more millimeter of it and she'll get mad—like I did a second ago except more so—and you'll wish to Klono you had never been born. She'll never make a sign until she blows up, but I'm telling you that she's as much harder and tougher than I am as she is older, and what she always does to people who cross

her I wouldn't want to watch happen again, even to a snake. Want to know what she'll do to you first? She'll pick you up, curl you into a perfect circle, pull off your arms, shove both your legs down your throat to the knees, and roll you down that chute there into the ocean. After that I don't know what she'll do—depends on how much pressure she develops before she blows up. One thing, though, she's always sorry afterward—why, she even attends the funeral, sometimes, and insists on paying the expenses!"

With which outrageous thought she kissed Clarrissa an enthusiastic good-by. "Told you I couldn't stay a minute. Got to do a flit—'see a man about a dog.' Came a million parsecs to squeeze you, Mums, but it was worth it. Clear ether!"

She was gone; and it was a dewy-eyed and rapt mother, not a Lensman, who turned to the still completely disorganized Lyranian. Clarrissa had perceived nothing whatever of what had happened—Karen had very carefully seen to that.

"My daughter," Clarrissa mused, as much to herself as to Ladora. "One of four. The four dearest, finest, sweetest girls that ever lived. I often wonder how a woman of my limitations, of my faults, could possibly have borne such children."

And Ladora of Lyrane, humorless and literal as all Lyranians are, took those thoughts at their face value and correlated their every connotation and implication with what she herself had perceived in that "dear, sweet" daughter's mind; with what that daughter had done and had said. The nature and quality of this hellish person's "limitations" and "faults" became eminently clear, and as she perceived what she thought was the truth, the Lyranian literally cringed.

"As you know, I have been in doubt as to whether or not to support you actively, as you wish," Ladora offered, as the two walked together across the field, toward the line of ground-cars. "On the one hand, the certainty that the safety, and perhaps the very existence, of my race will be at hazard; on the other the possibility that you are right in saying that the situation will continue to deteriorate if we do nothing. The decision has not been an easy one to make." Ladora was no longer aloof. She was just plain scared. She had been talking against time, and hoping that the help for which she had long since called would arrive in time. "I have touched only the outer surfaces of your mind. Will you allow me, without offense, to test its inner quality before deciding definitely?" she asked, and in the instant of asking sent out an exploratory tentacle of thought which was in actuality a full-driven probe.

"I will not." Ladora's beam struck a barrier which seemed to her exactly like the daughter's. None of her race had developed anything like it. She had never seen . . . yes, she had, too—years ago, when she was a child, that time in the assembly hall—that utterly hated male, Kinnison of Tellus! This visitor, then, was not a real person

at all, but a *female*—Kinnison's female—the Red Lensman, of whom even Lyrane had heard—and that pers . . . that *thing* was their offspring! But behind that impenetrable block there might very well be --there probably was—exactly the kind of mind that the offspring had described. A creature who was physically a person, but mentally that inconceivable monstrosity, a *female,* might be anything and might do anything. Ladora temporized.

"Excuse me; I did not mean to intrude against your will," she apologized, smoothly enough. "Since your attitude makes it extremely difficult for me to co-operate with you, I can make no promises as yet. What is it that you wish to know first?"

"I wish to interview your predecessor Elder Person, the one we called Helen." Strangely refreshed, in a sense galvanized by the brief personal visit with her dynamic daughter, it was no longer Mrs. Kimball Kinnison who faced the Lyranian Queen. Instead, it was the Red Lensman; a full-powered Second-Stage Lensman who had finally decided that, since appeals to reason, logic, and common sense had no perceptible effect upon this stiff-necked near-woman, the time had come to bear down. "Furthermore, I intend to interview her now, and not at some such indefinite future time as your whim may see fit to allow."

Ladora sent out a final desperate call for help and mustered her every force against the interloper. Fast and strong as her mind was, however, the Red Lensman's was faster and stronger. The Lyranian's defensive structure was wrecked in the instant of its building, the frantically struggling mind was taken over *in toto.* Help arrived—uselessly; since, although Clarrissa's newly enlarged mind had not been put to warlike use, it was brilliantly keen and ultimately sure. Nor, in times of stress, did the softer side of her nature operate to stay mind or hand. While carrying Lensman's Load she contained no more of ruth for Civilization's foes than did abysmally frigid Nadreck himself.

Head thrown back, taut and tense, gold-flecked tawny eyes flashing, she stood there for a moment and took on her shield everything that those belligerent persons could send. More, she returned it in kind, plus; and under those withering blasts of force more than one of her attackers ceased to live. Then, still holding her block, she and her unwilling captive raced across the field toward the line of peculiar little fabric-and-wire machines which were still the last word in Lyranian air transport.

Clarrissa knew that the Lyranians had no modern offensive or defensive weapons. They did, however, have some fairly good artillery at that airport; and she hoped fervently as she ran that she could put out jets enough to spoil the aim and fusing—luckily, they hadn't developed proximity fuses yet!—of what ack-ack they could bring to bear on her crate during the few minutes

she would have to use it. Fortunately, there was no artillery at the small, unimportant airport on which her speedster lay.

"Here we are. We'll take this tripe—it's the fastest thing here!"

Clarrissa could operate the triplane, of course—any knowledge or ability that Ladora had ever had was now and permanently the Lensman's. She started the queer engines; and as the powerful little plane screamed into the air, hanging from its props, she devoted what of her mind she could spare to the problem of antiaircraft fire. She could not handle all the guncrews; but she could and did command the most important members of most of them. Thus, nearly all of the shells either went wide or exploded too soon. Since she knew every point of aim of the few guns with whose operations she could not interfere, she avoided their missiles by not being at any one of those points at the predetermined instant of functioning.

Thus plane and passengers escaped unscathed and in a matter of minutes arrived at their destination. The Lyranians there had been alerted, of course; but they were few in number and they had not been informed that it would take physical force, not mental, to keep that red-headed pseudoperson from boarding her outlandish ship of space.

In a few more minutes, then, Clarrissa and her captive, safe in the speedster, were high in the stratosphere. Clarrissa sat Ladora down—hard—in a seat and fastened the safety straps.

"Stay in that seat and keep your thoughts to yourself," she directed, curtly. "If you don't, you'll never again either move or think in this life." She opened a sliding door, put on a couple of wisps of Manarkan glamourette, reached for a dress, and paused. Eyes glowing, she gazed hungrily at a suit of plain gray leather; a costume which she had not as yet so much as tried on. Should she wear it, or not?

She could work efficiently—at service maximum, really—in ordinary clothes. Ditto, although she didn't like to, unclothed. In Gray, though, she could hit absolute max if she had to. Nor had there ever been any question of right involved; the only barrier had been her own hypersensitivity.

For over twenty years she herself had been the only one to deny her right. What license, she was wont to ask, did an imitation or synthetic or amateur or "Red" Lensman have to wear the garb which meant so much to so many? Over those years, however, it had become increasingly widely known that hers was one of the five finest and most powerful minds in the entire Gray Legion; and when Co-ordinator Kinnison recalled her to active duty in Unattached status, that Legion passed by unanimous vote a resolution asking her to join them in Gray. Psychics all, they knew that nothing less would suffice; that if there was any trace of resentment or of antagonism or of feeling that she did not intrinsically belong, she

would never don the uniform which every adherent of Civilization so revered and for which, deep down, she had always so intensely longed. The Legion had sent her these Grays. Kit had convinced her that she did actually deserve them.

She really should wear them. She would.

She put them on, thrilling to the core as she did so, and made the quick little gesture she had seen Kim make so many times. Lensman's Seal. No one, however accustomed, has ever donned or ever will don unmoved the plain gray leather of the Unattached Lensman of the Galactic Patrol.

Hands on hips, she studied herself minutely and approvingly, both in the mirror and by means of her vastly more efficient sense of perception. She wriggled a little, and giggled inwardly as she remembered deploring as "exhibitionistic" this same conduct in her oldest daughter.

The Grays fitted her perfectly. A bit revealing, perhaps, but her figure was still good—very good, as a matter of fact. Not a speck of dirt or tarnish. Her DeLameters were fully charged. Her tremendous Lens flamed brilliantly upon her wrist. She looked—and felt—ready. She could hit absolute max in a fraction of a microsecond. If she had to get really tough, she would. She sent out a call.

"Helen of Lyrane! I know they've got you around here somewhere, and, if any of your guards try to screen out *this* thought, I'll burn their brains out. Clarrissa of Sol III calling. Come in, Helen!"

"Clarrissa!" This time there was no interference. A world of welcome was in every nuance of the thought. "Where are you?"

"High up, at—" Clarrissa gave her position. "I'm in my speedster, so can get to anywhere on the planet in minutes. More important, where are you? And why?"

"In jail, in my own—the Elder Person's—office." Queens should have palaces, but Lyrane's ruler did not. Everything was strictly utilitarian. "The tower on the corner, remember? On the top floor. 'Why' is too long to discuss now—I'd better tell you as much as possible of what you should know, while there is time."

"Time? Are you in danger?"

"Yes. Ladora would have killed me long ago if it had dared. My following grows less daily, the Boskonians stronger. The guards have already summoned help. They are coming now, to take me."

"That's what *they* think!" Clarrissa had already reached the scene. She had exactly the velocity she wanted. She slanted downward in a screaming dive. "Can you tell whether they're limbering up any of that ack-ack around the office, or not?"

"I don't believe so—I don't feel any such thoughts."

"QX. Get away from the window." If they hadn't started already, they never would start, the Red Lensman was deadly sure of that.

She came within range—her range—of the guns. She was in

time. Several gunners were running toward their stations. None of them arrived. The speedster leveled off and stuck its hard nose into and almost through the indicated room; reinforced concrete, steel bars, and glass showering abroad as it did so. The port snapped open. As Helen leaped in, Clarrissa practically threw Ladora out.

"Bring Ladora back!" Helen demanded. "I shall have its life!"

"Nix!" Clarrissa snapped. "I know everything that she does. We've other fish to fry, my dear."

The massive door clanged shut. The speedster darted forward, straight through the solid concrete wall. That small vessel, solidly built of beryllium alloys, had been designed to take brutal punishment. She took it.

Out in open space, Clarrissa went free, leaving the artificial gravity at normal. Helen stood up, took Clarrissa's hand, and shook it gravely and strongly; a gesture at which the Red Lensman almost choked.

Helen of Lyrane had changed even less than had the Earthwoman. She was still six feet tall; erect, taut, springy, and poised. She didn't weigh a pound more than the one-eighty she had scaled twenty-odd years ago. Her vivid auburn hair showed not one strand of gray. Her eyes were as clear and as proud; her skin almost as fine and firm.

"You are, then, alone?" In spite of her control, Helen's thought showed relief.

"Yes. My hus . . . Kimball Kinnison is very busy elsewhere." Clarrissa understood perfectly. Helen, after twenty years of thinking things over, really liked her; but she still simply couldn't stand a male, not even Kim; any more than Clarrissa could ever adapt herself to the Lyranian habit of using the neuter pronoun "it" when referring to one of themselves. She couldn't. Anybody who ever got a glimpse of Helen would have to think of her as *"she"!* But enough of this woolgathering—which had taken perhaps one millisecond of time.

"There's nothing to keep us from working together perfectly," Clarrissa's thought flashed on. "Ladora didn't know much, and you do. So tell me all about things, so that we can decide where to begin!"

XVII.

When Kandron called his minion in that small and nameless base to learn whether or not he had succeeded in trapping the Palainian Lensman, Nadreck's relay station functioned so perfectly, and Nadreck was so completely in charge of his captive's mind, that the caller could feel nothing out of the ordinary. Ultra-suspicious though Kandron was, there was nothing whatever to indicate that anything had changed at, or pertaining to, that base since he had last called its commander. That individual's subconscious mind reacted properly to the key stimulus. The conscious mind took over, remembered, and answered properly a series of trick questions.

These things occurred because the

Base Commander was still alive. His ego, the pattern and matrix of his personality, was still in existence and had not been changed. What Kandron did not and could not suspect was that that ego was no longer in control of the commander's mind, brain, or body; that it was utterly unable of its own volition, either to think any iota of independent thought or to stimulate any single physical cell. The Onlonian's ego was present—just barely present—but that was all. It was Nadreck who, using that ego as a guide and, in a sense, as a helplessly impotent transformer, received the call. Nadreck made those exactly correct replies. Nadreck was now ready to render a detailed and fully documented—and completely mendacious—report upon his own destruction!

Nadreck's special tracers were already out, determining line and intensity. Strippers and analyzers were busily at work on the fringes of the beam, dissecting out, isolating, and identifying each of the many scraps of extraneous thought accompanying the main beam. These side-thoughts, in fact, were Nadreck's prime concern. The Second-Stage Lensmen had learned that no being—except possibly an Arisian—could narrow a beam of thought down to one single, pure sequence. Only Nadreck, however, recognized in those side-bands a rich field; only he had designed and developed mechanisms with which to work that field.

The stronger and clearer the mind, the fewer and less complete were the extraneous fragments of thought: but Nadreck knew that even Kandron's brain would carry quite a few such nongermane accompaniments, and from each of those bits he could reconstruct an entire sequence as accurately as a competent paleontologist reconstructs a prehistoric animal from one fossilized piece of bone.

Thus Nadreck was completely ready when the harshly domineering Kandron asked his first real question.

"I do not suppose that you have succeeded in killing the Lensman?"

"Yes, Your Supremacy, I have." Nadreck could feel Kandron's start of surprise; could perceive without his instruments Kandron's fleeting thoughts of the hundreds of unsuccessful previous attempts upon his life. It was clear that the Onlonian was not at all credulous.

"Report in detail!" Kandron ordered.

Nadreck did so, adhering rigidly to the truth up to the moment in which his probes of force had touched off the Boskonian alarms. Then:

"Spy-ray photographs taken at the instant of alarm show an indetectable speedster, with one, and only one occupant, as Your Supremacy anticipated. A careful study of all the pictures taken of that occupant shows: first, that he was definitely alive at that time, and was neither a projection nor an artificial mechanism; and second, that his physical measurements agree in every particular with the

specifications furnished by Your Supremacy as being those of Nadreck of Palain VII.

"Since Your Supremacy personally computed and supervised the placement of those projectors," Nadreck went smoothly on, "you know that the possibility is vanishingly small that any material thing, free or inert, could have escaped destruction. As a check, I caused to be taken seven hundred twenty-nine—three to the sixth power—samples of the circumambient space, statistically at random, for analysis. After appropriate allowances for the exactly-observed elapsed times of sampling, diffusion of droplets and molecular and atomic aggregates, temperatures, pressures, and all other factors known or assumed to be operating, I determined that there had been present, in the center of action of our beams a mass of approximately four thousand six hundred seventy-eight point o one metric tons. This value, Your Supremacy will note, is in close agreement with the most efficient mass of an indetectable speedster designed for long-distance work."

That figure was in fact closer than close. It was an almost exact statement of the actual mass of Nadreck's ship.

"Exact composition?" Kandron demanded.

Nadreck recited a rapid-fire string of elements and figures. They, too, were correct within the experimental error of a very good analyst. The Base Commander could not possibly have known them; but it was well within the bounds of possibility that the insidious Kandron would. He did. He was now practically certain that his ablest and bitterest enemy had been destroyed at last, but there were still a few lingering shreds of doubt.

"Let me look over your work," Kandron directed.

"Yes, Your Supremacy." Nadreck the Thorough was ready for even that extreme test. Through the eyes of the ultimately enslaved Base Commander Kandron checked and rechecked Nadreck's pictures, Nadreck's charts and diagrams, Nadreck's more than four hundred pages of mathematical, physical, and chemical notes and determinations; all without finding a single flaw.

In the end Kandron was ready to believe that Nadreck had in fact ceased to exist. However, he himself had not done the work. There was no corpse. If he himself had killed the Palainian, if he himself had actually felt the Lensman's life depart in the grasp of his own tentacles, then, and only then, would he have *known* that Nadreck was dead. As it was, even though the work had been done in exact accordance with his own instructions, there remained an infinitesimal uncertainty. Wherefore:

"Shift your field of operations to cover X-174, Y-240, Z-16. Do not relax your vigilance in the slightest because of what has happened." He considered briefly the idea of allowing his minion to call him, in case anything happened, but decided against it. "Are the men standing up?"

"Yes, Your Supremacy, they are in very good shape indeed."

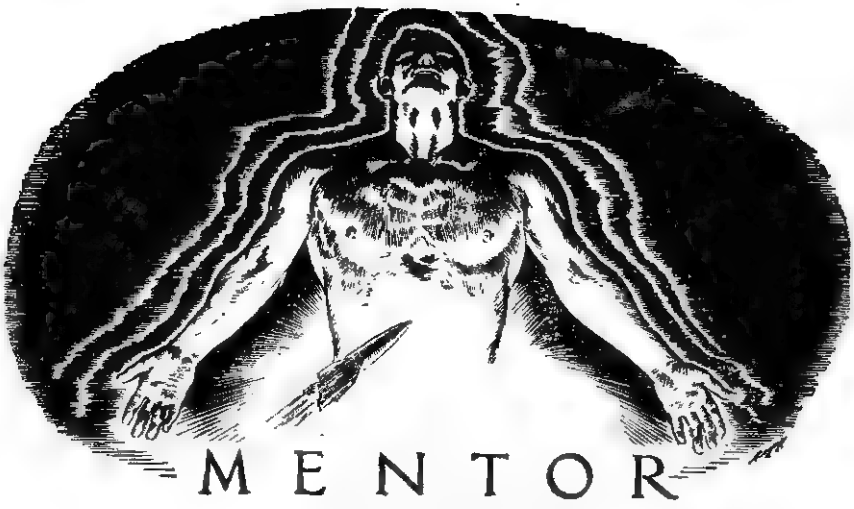
And so on. "Yes, Your Supremacy, the psychologist is doing a very fine job. Yes, Your Supremacy . . . yes . . . yes . . . yes—"

Very shortly after the characteristically Kandronesque ending of that interview, Nadreck had learned everything he needed to know. He knew where Kandron was and what he was doing. He knew much of what Kandron had done during the preceding twenty years; and, since he himself figured prominently in many of those sequences, they constituted invaluable checks upon the validity of his other reconstructions. He knew the construction, the armament, and the various ingenious mechanisms, including the locks, of Kandron's vessel; he knew more than any other outsider had even known of Kandron's private life. He knew where Kandron was going next, and what he was going to do there. He knew in broad what Kandron intended to do during the coming century.

Thus well informed, Nadreck set his speedster into a course toward the planet of Civilization which was Kandron's next objective. He did not hurry; it was no part of his plan to interfere in any way in the horrible program of planet-wide madness and slaughter which Kandron had in mind. It simply did not occur to him to try to save the planet as well as to kill the Onlonian; Nadreck, being Nadreck, took without doubt or question the safest and surest course.

Nadreck knew that Kandron would set his vessel into an orbit around the planet, and that he would take a small boat—a flitter—for the one personal visit necessary to establish his lines of communication and control. Vessel and flitter would be alike indetectable, of course; but Nadreck found the one easily enough and knew when the other left its mother-ship. Then, using his lightest, stealthiest spy rays, the Palainian set about the exceedingly delicate business of boarding the Boskonian craft.

That undertaking could be made a story in its own right, for Kandron did not leave his ship unguarded. However, merely by thinking about his own safety, Kandron had all unwittingly given away the keys to his supposedly impregnable fortress. While Kandron was wondering whether or not the Lensman was really dead, and especially after he had been convinced that he most probably was, the Onlonian's thoughts had touched fleetingly upon a multitude of closely-related subjects. Would it be safe to abandon some of the more onerous precautions he had always taken, and which had served him so well for so many years? And as he thought of them, each one of his safeguards flashed at least partially into view; and for Nadreck, any significant part was practically as good as the whole. Kandron's protective devices, therefore, did not protect. Projectors, designed to flame out against intruders, remained cold. Ports opened; and as Nadreck touched sundry buttons, various in-



visible beams, whose breaking would have produced unpleasant results, ceased to exist. In short, Nadreck knew all the answers. If he had not been coldly certain that his information was complete, he would not have acted at all.

After entry, his first care was to send out spotting devices which would give ample warning in case the Onlonian should return unexpectedly soon. Then, working in the service-spaces behind instrument boards and panels, in junction boxes, and in various other out-of-the-way places, he cut into lead after lead, ran wire after wire, and installed item after item of apparatus and equipment upon which he had been at work for weeks. He finished his work undisturbed. He checked and rechecked the circuits, making absolutely certain that every major one of the vessel's controlling leads ran to or through at least one of the things he had just installed. With painstaking nicety he obliterated every visible sign of his visit. He departed as carefully as he had come; restoring to full efficiency as he went each one of Kandron's burglar alarms.

Kandron returned, entered his ship as usual, stored his flitter, and extended a tentacular member toward the row of switches on his panel.

"Don't touch anything, Kandron," he was advised by a thought as cold and as deadly as any one of his own; and upon the Onlonian equivalent of a visiplate there appeared the one likeness which he least expected and least desired to perceive.

"Nadreck of Palain VII—Star A Star—THE Lensman!" The Onlonian was physically and emotionally incapable of gasping, but the idea is appropriate. "You have, then, wired and mined this ship."

There was a subdued clicking of

relays. The Bergenholm came up to speed, the speedster spun about and darted straight away from the planet under a couple of kilodynes of drive.

"I am Nadreck of Palain VII, yes. One of the group of Lensmen whose collective activities you have ascribed to Star-A-Star and *the* Lensman. Your ship is, as you have deduced, mined. The only reason you did not die as you entered it is that I wish to be absolutely certain; and not merely statistically so, that it is actually Kandron of Onlo, and not someone else, who dies."

"That unutterable fool!" Kandron quivered in helpless rage. "Oh, that I had taken the time and killed you myself!"

"If you had done your own work, the techniques I used here could not have been employed, and you might have been in no danger at the present moment," Nadreck admitted, equably enough. "My powers are small, my intellect feeble, and what might have been has no present bearing. I am inclined, however, to question the validity of your conclusions, due to the known fact that you have been directing a campaign against me for over twenty years without success; whereas I have succeeded against you in less than half a year. My analysis is now complete. You may now touch any control you please. By the way, you do not deny that you are Kandron of Onlo, do you?"

Neither of those monstrous beings asked, suggested, or even thought of mercy. In neither of their languages was there any word for or concept of such a thing.

"That would be idle. You have a record of my life pattern, of course, just as I have one of yours. But I cannot understand how you got through that—"

"It is not necessary that you should. Do you wish to close one of those switches or shall I?"

Kandron had been thinking for minutes, studying every aspect of his predicament. Knowing Nadreck, he knew just how desperate the situation was. However, there was one very small chance—just one. The way he had come was clear. He knew that that was the *only* clear way. Wherefore, to gain an extra instant of time, he reached out toward a switch; but even while he was reaching he put every ounce of his tremendous strength into a leap which hurled him across the room toward his flitter.

No luck. One of Nadreck's minor tentacles was already curled around a switch, tensed and ready. Kandron had not moved a foot when a relay snapped shut and four canisters of duodec detonated as one. Duodecaplylatomate, that frightful detonant whose violence is exceeded only by that of nuclear disintegration itself!

There was an appalling flash of viciously white light, which expanded in microseconds into an enormous globe of incandescent gas. Cooling and darkening as it expanded rapidly into the near-vacuum of interplanetary space, the gases and vapors soon became invisible. Through and throughout the entire

volume of volatilization Nadreck drove analyzers and detectors, until it was a mathematical certainty that no particle of material substance larger in diameter than five microns remained of either Kandron or his spaceship. He then called the Gray Lensman.

"Kinnison. Nadreck of Palain VII calling, to report that my assignment has been completed. I have destroyed Kandron of Onlo."

"Good! Fine business, ace! What kind of a picture did you get? He must have known something about the higher echelons—or did he? Was he just another dead end?"

"I did not go into that."

"Huh? Why not?" Kinnison demanded, exasperation in every line of his thought.

"Because it was not included in the project," Nadreck explained, patiently. "You already know that one must concentrate in order to work efficiently. To secure the requisite minimum of information it was necessary to steer his thoughts into one, and only one, set of channels. There were some foreign side-bands, of course, and it may be that some of them touched upon this new subject which you have now, too late, introduced . . . no, there were no such."

"Damnation!" Kinnison exploded; then by main strength shut himself up. "QX, ace; skip it. But listen, my spiny and murderous friend. Get this—engrave it in big type right on the top-side inside of your thick skull—what we want is INFORMATION, not mere liquidation. Next time you get hold of such a big shot as Kandron must have been, don't kill him until either: first, you get some leads as to who or what the real head of the outfit is; or, second, you make sure that he doesn't know. Then kill him all you want to, but FIND OUT WHAT HE KNOWS FIRST. Have I made myself clear this time?"

"You have, and as Co-ordinator your instructions should and will govern. I point out, however, that the introduction of a multiplicity of objectives into a problem not only destroys its unity, but also increases markedly both the time necessary for, and the actual personal danger involved in, its solution."

"So what?" Kinnison countered, as evenly as he could. "That way, we may be able to get the answer some day. Your way, we never will. But the thing's done—there's no use yapping and yowling about it now. Have you any ideas as to what you should do next?"

"No. Whatever you wish, that I shall try to do."

"I'll check with the others." He did so, receiving no helpful ideas until he consulted his wife.

"Hi, Kim, my dear!" came Clarrissa's buoyant thought; and, after a brief but intense greeting: "Glad you called. Nothing definite enough yet to report to you officially, but there are indications that Lyrane IX may be an important—"

"Nine?" Kinnison interrupted. "Not Eight again?"

"Nine," she confirmed. "A new

item.' So I may be doing a flit over there one of these days."

"Uh-uh," he denied. "Lyrane IX would be none of your business. Stay away from it."

"Says who?" she demanded. "We went into this once before, Kim, about you telling me what I could and couldn't do."

"Yeah, and I came out second best." Kinnison grinned. "But now, as the Co-ordinator, I make suggestions to even Second-Stage Lensmen, and they follow them—or else. I, therefore, suggest officially that you stay away from Lyrane IX on the grounds that since it is colder than a Palainian's heart, it is definitely not your problem, but Nadreck's. And personally, I am adding that if you don't behave yourself I'll come over there and administer appropriate physical suasion."

"Come on over—that would be fun!" Clarrissa giggled, then sobered quickly. "But seriously, you win, I guess—this time. You'll keep me informed?"

"I'll do that. Clear ether, Chris!" and he turned back to the Palainian.

". . . so you see this is your problem. Go to it, little chum."

"I go, Kinnison."

XVIII.

For hours Camilla Kinnison and Tregonsee wrestled separately and fruitlessly with the problem of the elusive "X." Then, after she had studied the Rigellian's mind in a fashion which he could neither detect nor employ, Camilla broke the mental silence.

"Uncle Trig, my conclusions frighten me. Can you conceive of the possibility that it was contact with *my* mind, not yours, that made 'X' run away?"

"That is the only tenable conclusion. I know the limitations of my own mind, but I have never been able to guess at the capabilities of yours. I fear that I, at least, underestimated our opponent."

"I know that I did, and I was terribly wrong. I shouldn't have tried to fool you, either, even a little bit. There are some things about me that I just *can't* show to most people, but you are different—you're *such* a wonderful person!"

"Thanks, Camilla, for your trust." Understandingly, he did not go on to say that he would keep on being worthy of it. "I accept the fact that you Five, being children of two Second-Stage Lensmen, are basically beyond my comprehension. There are indications that you do not as yet thoroughly understand yourself. You have, however, decided upon a course of action."

"Oh—I'm *so* relieved! Yes, I have. But before we go into that, I haven't been able to solve the problem of 'X.' More, I have proved that I cannot solve it without more data. Therefore, you can't, either. Check?"

"I had not yet reached that conclusion, but I accept your statement as truth."

"One of those uncommon powers of mine, to which you referred a while ago, is a wide range of per-

ception, from large masses down to extremely tiny components. Another, or perhaps a part of the same one, is that, after resolving and analyzing these fine details, I can build up a logical and coherent whole by processes of interpolation and extrapolation."

"I can believe that such things would be possible to such a mind as yours must be. Go on."

"Well, that is how I know that I underestimated Mr. 'X.' Whoever or whatever he is, I am completely unable to resolve the structure of his thought. I gave you all I got of it. Look at it again, please—hard. What can you make of it now?"

"It is exactly the same as it was before; a fragment of a simple and plain introductory thought to an audience. That is all."

"That's all I can see, too, and that's what surprises me so." The hitherto imperturbable and serene Camilla got up and began to pace the floor. "That thought is apparently absolutely solid; and since that is a definitely impossible condition, the truth is that its structure is so fine that I cannot resolve it into its component units. This fact shows that I am not nearly so competent as I thought I was. When you and Dad and the others reached that point, you each went to Arisia. I have decided to do the same thing."

"That decision seems eminently sound."

"Thanks, Uncle Trig—that was what I hoped you would say. I have never been there, you know, and the idea scared me a little. Clear ether!"

There is no need to go into detail as to Camilla's bout with Mentor. Her mind, like Karen's, had had to mature of itself before any treatment could be really effective; but once mature, she took as much in one session as Kathryn had taken in all her many. She had not suggested that the Rigellian accompany her to Arisia; they both knew that he had already received all that he could take. Upon her return she greeted him as casually as though she had been gone only a matter of hours.

"What Mentor did to me, Uncle Trig, shouldn't have been done to a Delgonian catlat. It doesn't show too much, though, I hope—does it?"

"Not at all." He scanned her narrowly, both physically and mentally. "I can perceive no change in detail. In general, however, you have changed. You have developed."

"Yes, more than I would have believed possible. I can't do much with my present very poor transcription of that thought, since the all-important fine detail is missing. We'll have to intercept another one. I'll get it *all*, this time, and it will tell us a lot."

"But you did something with this one, I am sure. There must have been some developable features—a sort of latent-image effect?"

"A little. Practically infinitesimal compared to what was really there. Physically, his classification to four places is TUUV; quite a bit like the Nevians, you notice. His home planet is big, and practically covered with liquid. No real cities, just

groups of half-submerged, temporary structures. Mentality very high, but we knew that already. Normally, he thinks upon a very short wave, so short that he was then working at the very bottom of his range. His sun is a fairly hot main-sequence-star, of spectral class somewhere around F, and it's probably more or less variable, because there was quite a distinct implication of change. But that's normal enough, isn't it?"

Within the limits imposed by the amount and kind of data available, Camilla's observations and analyses had been perfect, her reconstruction flawless. She did not then have any idea, however, that "X" was in fact a spring-form Plooran. More, she did not even know that such a planet as Ploor existed, except for Mentor's one mention of it.

"Of course. Peoples of planets of variable suns think that such suns are the only kind fit to have planets. You cannot reconstruct the nature of the change?"

"No. Worse, I can't find even a hint of where his planet is in space—but then, I probably couldn't, anyway, even with a whole, fresh thought to study."

"Probably not. 'Rigel Four' would be an utterly meaningless thought to anyone ignorant of Rigel; and, except when making a conscious effort, as in directing strangers, I never think of its location in terms of galactic co-ordinates. I suppose that the location of a home planet is always taken for granted. That would seem to leave us just about where we were before in our search for 'X,' except for your implied ability to intercept another of his thoughts, almost at will. Explain, please."

"Not *my* ability—ours." Camilla smiled, confidently. I couldn't do it alone, neither could you, but between us I don't believe that it will be too difficult. You, with your utterly calm, utterly unshakable certainty, can drive a thought to any corner of the universe. You can fix and hold it steady on any indicated atom. I can't do that, or anything like it, but with my present ability to detect and to analyze, I am not afraid of missing 'X' if we can come within parsecs of him. So my idea is a sort of piggy-back hunting trip: you to take me for a ride, mentally, very much as Worsel takes Con, physically. That would work, don't you think?"

"Perfectly, I am sure." The stolid Rigellian was immensely pleased. "Link your mind with mine, then, and we will set out. If you have no better plan of action mapped out, I would suggest starting at the point where we lost him and working outward, covering an expanding sphere."

"You know best. I will stick to you wherever you go. I am ready."

Tregonsee launched his thought; a thought which, at a velocity not to be measured even in multiples of that of light, generated the surface of a continuously enlarging sphere of space. And with that thought, a very part of it, sped Camilla's incomprehensibly delicate, instantaneously reactive detector web. The

Rigellian, with his unhuman perseverance, would have surveyed total space had it been necessary; and the now adult Camilla would have stayed with him. However, the patient pair did not have to comb all of space. In a matter of hours the girl's almost infinitely tenuous detector touched, with infinitesimal power and for an inappreciable instant of time, the exact thought-structure to which it had been so carefully attuned.

"Halt!" she flashed, and Tregonsee's mighty superdreadnought shot away along the indicated line at maximum blast.

"You are not now thinking at him, of course, but how sure are you that he did not feel your detector?" Tregonsee asked.

"Positive," the girl replied. "I couldn't even feel it myself until after a million-fold amplification. It was just a web, you know, not nearly solid enough for an analyzer or a recorder. I didn't touch his mind at all. However, when we get close enough to work efficiently, which will be in about five days, we will have to touch him. Assuming that he is as sensitive as we are, he will feel us; hence we will have to work fast and according to some definite plan. What are your ideas as to technique?"

"I may offer a suggestion or two, later, but I resign leadership to you. You already have made plans, have you not?"

"Only a framework, I could not go into detail without consulting you. Since we agree that it was my mind that he did not like, you will have to make the first contact."

"Of course. But since the action of thought is so nearly instantaneous, are you sure that you will be able to protect yourself in case he overcomes me at that first contact?" If the Rigellian gave any thought at all to his own fate in such a case, no trace of it was evident.

"My screens are good. I am fairly certain that I could protect both of us, but it might slow me down a trifle; and even an instant's delay might keep me from getting the information we want. It would be better, I think, to call Kit in. Or, better yet, Kay. She can stop a superatomic bomb. With Kay covering us both, we will be free to put our full power into the offense."

"And that offense is to be—?"

"I have no idea. We will work that out together."

Again they went into a union of minds; considering, weighing, analyzing, rejecting, and—a few times—accepting. And finally, well within the five-day time limit, they had drawn up a completely detailed plan of battle.

How uselessly that time was spent! For that battle, instead of progressing according to their carefully worked-out plan, was ended almost in the instant of its beginning.

According to plan, Tregonsee tuned his mind to "X's" pattern as soon as they had come within working range. He reached out as delicately as he could; and his best was very fine work indeed.

He might just as well have struck with all his power, for at the first touch of the fringe, extremely light and entirely innocuous though it was, the stranger's barriers flared into being and there came back instantly a mental bolt of such vicious intensity that it would have gone through Tregonsee's hardest-held block as though no barrier had been there. But that bolt did not strike Tregonsee's shield; he did not even know, until much later, that it had been sent. Instead, it struck Karen Kinnison's, which has already been described.

It did not exactly bounce, nor did it cling, nor did it linger, even for a microsecond, to do battle as expected. It simply vanished; as though that minute interval of time had been sufficient for the enemy to have recovered from the shock of encountering a completely unexpected resistance, to have analyzed the texture of the shield, to have deduced from that analysis the full capabilities of its owner and operator, to have decided that he did not care to have any dealings with the entity so deduced, and finally, as he no doubt supposed, to have begun to retreat in good order.

His retreat, however, was not in good order. He did not escape, this time. This time, as she had declared that she would be, Camilla was ready for anything—literally anything. Everything she had—and she had plenty—was on the trips; tense, taut, and poised. Knowing that Karen, the Ultimate of Defense, was on guard, she was wholly free to hurl her every force in the instant of perceiving the enemy's poignant thrust. Scarcely had the leading element of her attack touched the stranger's screens, however, when those screens, "X" himself, his vessel and any others that might have been accompanying it, and everything tangible in nearby space, all disappeared at once in the inconceivably violent, the ultimately cataclysmic detonation of a superatomic bomb.

It may not, perhaps, be generally known that the "completely liberating" or "superatomic" bomb liberates one hundred percent of the total component energy of two or more subcritical masses of an unstable isotope, in a space of time estimated to be sixty-nine hundredths of one microsecond. Its violence and desructiveness thus differ, both in degree and in kind, from those of the earlier type, which liberated only the energy of nuclear fission, very much as the radiation of S-Doradus differs from that of Earth's moon. Its mass attains, and holds for an appreciable length of time, a temperature to be measured only in millions of Centigrade degrees; which fact accounts in large part for its utterly incredible vehemence.

Nothing inert in its entire sphere of primary action can even begin to move out of the way before being reduced to its subatomic constituents and thus contributing in some measure to the cataclysm. Nothing is or becomes visible until the secondary stage begins; until

the frightful globe has expanded to a diameter of some hundreds of miles and by this expansion has cooled down to a point at which some of its radiation lies in the visible violet. And as for lethal radiation—there are radiations and they are lethal.

The battle with "X" had occupied approximately two milliseconds of actual time. The expansion had been progressing for a second or two when Karen lowered her shield.

"Well, that finishes that," she commented. "I'd better get back on the job. Did you find out what you want to know, Cam, or not?"

"I got a little in the moment before the explosion. Not much." Camilla was deep in study. "It is going to be quite a job of reconstruction. One thing of interest to you, though, is that this 'X' had quit sabotage temporarily and was on his way to Lyrane IX, where he had some kind of important—"

"Nine?" Karen asked, sharply. "Not Eight? I've been watching Eight, you know—I haven't even thought of Nine."

"Nine, definitely. The thought was clear. You might give it a scan once in a while. How is mother doing?"

"She's doing a grand job, and that Helen is quite an operator, too. I'm not doing much—just a touch here and there—I'll see what I can see on Nine. I'm not the scanner or detector that you are, though, you know—maybe you'd better come over here too, in person. Suppose?"

"I think so—don't you, Uncle Trig?" Tregonsee did. "We can do some exploring as we come, but since I have no definite patterns for web work, we may not be able to do much until we get close. Clear ether, Kay!"

"The fine structure is there, and I can resolve it and analyze it," Camilla informed Tregonsee, after a few hours of intense concentration. "There are quite a few clear extraneous sequences, instead of the blurred latent images we had before, but there is still no indication whatever of the location of his home planet. I can see his physical classification to ten places instead of four, more detail as to the sun's variation, the seasons, their habits, and so on. Things that seem mostly to be of very little importance, as far as we are concerned. I found one fact, though, that is new and important. According to my reconstruction, his business on Lyrane IX was the induction of Boskonian Lensmen—*Black* Lensmen, Tregonsee, just as father suspected!"

"In that case, he must have been the Boskonian counterpart of an Arisian, and hence one of the highest echelon. I am very glad indeed that you and Karen relieved me of the necessity of trying to handle him myself. Kinnison will be very glad to know that we have at last and in fact reached the top—"

Camilla was paying attention to

the Rigellian's cogitations with only a fraction of her mind; most of it being engaged in a private conversation with her brother.

"... so you see, Kit, he was under a subconscious compulsion. He *had* to destroy himself, his ship, and everything in it, in the very instant of attack by any mind definitely superior to his own. Therefore he couldn't have been an Eddorian, possibly, but merely another intermediate, and I haven't been of much help."

"Sure you have, Cam! You got a lot of information, and some mighty good leads to Lyrane IX and what goes on there. I'm on my way to Eddore now; and by working down from there and up from Lyrane IX we can't go wrong. Clear ether, Sis!"

XIX.

Constance Kinnison did not waste much time in idle recriminations, even at herself. Realizing at last that she was still not fully competent, and being able to define exactly what she lacked, she went to Arisia for final treatment. She took that treatment and emerged from it, as her brother and sisters had emerged, a completely integrated personality.

She had something of everything the others had, of course, as did they all; but her dominants, the characteristics which had operated to make Worsel her favorite Second-Stage Lensman, were much like those of the Velantian. Her mind, like his, was quick and facile, yet of extraordinary power and range. She did not have much of her father's flat, driving urge or of his indomitable will to do; she was the least able of all the Five to exert long-sustained extreme effort. Her top, however, was vastly higher than theirs. Like Worsel's, her armament was almost entirely offensive—she was far and away the deadliest fighter of them all. She only of them all had more than a trace of pure killer instinct; and when roused to full fighting pitch her mental bolts were weapons of as starkly incomprehensible an effectiveness as the sphere of primary action of a superatomic bomb.

As soon as Constance had left the *Velan*, remarking that she was going to Arisia to take her medicine, Worsel called a staff meeting to discuss in detail the matter of the "Hell Hole in Space." That conference was neither long nor heated; it was unanimously agreed that that phenomenon was—*must* be—simply another undiscovered cavern of Overlords.

In view of the fact that Worsel and his crew had been hunting down and killing Overlords for more than twenty years, the only logical course of action was for them to deal similarly with one more, perhaps the only remaining large group of their hereditary foes. Nor did any doubt of their ability to do so enter any one of the Velantians' minds.

How wrong they were!

They did not have to search for the "Hell Hole." Long since, to

stop its dreadful toll, a spherical cordon of robot guard ships had been posted to warn all traffic away from the outer fringes of its influence. Since they merely warned against, but could not physically prohibit, entry into the dangerous space, Worsel did not pay any attention to the guard ships or to their signals as the *Velan* went through the warning web. His plans were, he thought, well laid. His ship was free. Its speed, by Velantian standards, was very low. Each member of his crew wore a full-coverage thought-screen; a similar and vastly more powerful screen would surround the whole vessel if one of Worsel's minor members were either to tighten or to relax its grip upon a spring-mounted control. Worsel was, he thought, ready for anything.

But the "Hell Hole in Space" was not a cavern of Overlords. No sun, no planet, nothing material existed within that spherical volume of space. That *something* was there, however, there was no doubt. Slow as was the *Velan's* pace, it was still too fast by far; for in a matter of minutes, through the supposedly impervious thought-screens, there came an attack of utterly malignant ferocity; an assault which tore at Worsel's mind in a fashion he had never imagined possible; a poignant, rending, unbearably crescendo force whose violence seemed to double with every mile of advance.

The *Velan's* all-encompassing screen snapped on—uselessly. Its tremendous power was as unopposed as were the lesser powers of the personal shields—that highly inimical thought was coming past, not through, the barriers. An Arisian, or one of the Children of the Lens, would have been able to perceive and to block that band; no one of lesser mental stature could.

Strong and fast as Worsel was, mentally and physically, he got his vessel turned around just barely in time. All his resistance and all his strength had to be called into play to maintain his mind's control over his body; to enable him to spin his ship end for end and to kick her drive up to maximum blast. To his surprise, his agony decreased with distance as rapidly as it had built up; disappearing entirely well before the *Velan* reached the web she had crossed such a short time before.

Groggy, sick, and shaken, hanging slackly from his bars, the Velantian Lensman was roused to action by the mental and physical frenzy of his crew. Ten of them had died in the Hell Hole; six more were torn to bits before their commander could muster enough force to stop their insane rioting. Then Master Therapist Worsel went to work; and one by one he brought the survivors back. They remembered; but he made those memories bearable.

He then called Kinnison. ". . . but there didn't seem to be anything personal about it, as one would expect from an Overlord," he concluded his brief report.

"It did not concentrate on us, reach for us, or follow us as we left. Its intensity seemed to vary only with distance . . . perhaps inversely as distance squared—it might very well have been radiated from a center. While it was nothing like anything I ever felt before, I still think that it must be an Overlord—maybe a sort of Second-Stage Overlord, just as you and I are Second-Stage Lensmen. He is too strong for me now, just as they used to be too strong for us before we met you. By the same reasoning, however, I am pretty sure that if you can come over here, you and I together could figure out a way of taking him. How about it?"

"Mighty interesting, and I'd like to, but I'm right in the middle of a job," Kinnison replied, and went on to explain rapidly what he, as Bradlow Thyron, had done and what he still had to do. "As soon as I can get away I'll come over. In the meantime, fellow old snake, keep away from there. Do a flit—find something else to keep you amused until I can join you."

Worsel set out, and after a few days . . . or weeks—idle time means practically nothing to a Velantian—a sharply-Lensed thought drove in.

"Help! A Lensman calling help! Line this thought and come at speed to System—" The message ended as sharply as it had begun; in a flare of agony which, Worsel knew, meant that that Lensman, whoever he was, had died.

Since the thought, although broadcast, had come in strong and clear, Worsel knew that its sender had been close by. While the time had been very short indeed, he had been able to get a line of sorts. Into that line he whirled the *Velan's* sharp prow and along it she hurtled at the literally inconceivable pace of her absolute-maximum drive. As the Gray Lensman had often remarked, the Velantian superdreadnought had more legs than a centipede, and now she was using them all. In minutes, then, the scene of battle grew large upon her plates.

The Patrol ship, hopelessly outclassed, could last only seconds longer. Her screens were down; her very wall shield was dead. Red pockmarks sprang into being along her sides as the Boskonian needle-beamers wiped out her few remaining controls. Then, as the helplessly raging Worsel looked on, his brain seething with unutterable Velantian profanity, the enemy prepared to board—a course of action which, Worsel could see, was changed abruptly by the fact—and perhaps as well by the terrific velocity—of his own unswerving approach. The conquered Patrol cruiser disappeared in a blaze of detonating duodec; the conqueror devoted his every jet to the task of running away; strewing his path as he did so with sundry items of solid and explosive destruction. Such things, however, whether dirigible or not,

whether inert or free, were old and simple stuff to the *Velan's* war-wise crew. Their spotters and detectors were full out, as was also a practically solid forefan of annihilating and disintegrating beams.

Thus none of the Boskonian's missiles touched the *Velan*, nor, with all his speed, could he escape. Few indeed were the ships of space able to step it, parsec for parsec, with Worsel's mighty craft, and this luckless pirate vessel was not one of them. Up and up the pursuer rushed; second by second the intervening distance lessened. Tractors shot out, locked on, and pulled briefly with all the force of their stupendous generators.

Briefly, but long enough. As Worsel had anticipated, that savage yank had, in the fraction of a second required for the Boskonian commander to recognize and to cut the tractors, been enough to bring the two inertialess war craft practically screen to screen.

"Primaries! Blast!" Worsel hurled the thought even before his tractors snapped. He was in no mood for a long-drawn-out engagement. He *might* be able to win with his secondaries, his needles, his tremendously powerful short-range stuff and his other ordinary offensive weapons, but he was taking no chances. Besides, the Boskonians might very well have primaries of their own by this time, and if they did his only chance was to use them first. His men knew what to do and would do it without further orders. A dozen or so of those hellishly irresistible projectors of sheer destruction lashed out as one.

One! Two! Three! The three courses of Boskonian defensive screen scarcely winked as each, locally overloaded, flared through the visible into the black and went down.

Crash! The stubborn fabric of the wall shield offered little more resistance before it, too, went down, exposing the bare metal of the Boskonian's hull—and, as is well known, any conceivable material substance simply vanishes, traceless, at the merest touch of such fields of force as those.

Driving projectors carved away and main batteries silenced, Worsel's needle-beamers proceeded systematically to riddle every control panel and every lifeboat, to make of the immense space rover a completely helpless hulk.

"Hold!" An observer flashed the thought. "Number Eight slip is empty—Number Eight lifeboat got away!"

"Damnation!" Worsel, at the head of his armed and armored storming party, as furiously eager as they to come to grips with the enemy, paused briefly. "Trace it—or can you?"

"I did. My tracers can hold it for fifteen minutes, perhaps twenty. No longer than twenty."

Worsel thought intensely. Which had first call, ship or lifeboat? The ship, he decided almost instantly. Its resources were vastly greater; most of its personnel were probably practically unharmed. Given

any time at all, they might very well be able to jury-rig a primary, and that would be bad—very bad. Besides, there were more people here; and even if, as was distinctly possible, the Boskonian big shot had abandoned his vessel and his crew in an attempt to save his own life, Worsel had plenty of time.

"Hold that lifeboat," he instructed the observer. "Ten minutes is all we need here."

And it was. The Boskonians—barrel-bodied, blocky-limbed monstrosities resembling human beings about as much as they did the Velantians—wore armor, possessed hand-weapons of power, and fought viciously. They had even managed to rig a few semiportable projectors, but none of these were allowed a single blast. Spy-ray observers were alert, and needle-beam operators; hence the fighting was all at hand to hand, with hand-weapons only. For, while the Velantians to a man lusted to kill, they had had it drilled into them for twenty years that the search for information came first; the pleasure of killing, second.

Worsel himself went straight for the Boskonian captain, his pre-selected prey. That wight had a couple of guards with him, but they did not matter—needle-ray men took care of them. He also had a pair of heavy beam guns, which he held steadily on the Velantian. Worsel paused momentarily; then, finding that his

screens were adequate, he slammed the control room door shut with a flick of his tail and launched himself, straight and level at his foe, with an acceleration of seven gravities. The captain tried to dodge but could not. The frightful impact did not kill him, but it hurt him, badly. Worsel, on the other hand, was scarcely jarred. Hard, tough, and durable, Velantians are accustomed from birth to knockings-about which would pulverize human bones.

Worsel batted the Boskonian's guns away with two terrific blows of an armored paw, noting as he did so that violent contact with a steel wall did not do their interior mechanisms a bit of good. Then, after cutting off both his enemy's screens and his own, he batted the Boskonian's helmet; at first experimentally, then with all his power. Unfortunately, however, it held. So did the thought-screen, and there were no external controls. That armor was good stuff!

Leaping to the ceiling, he blasted his whole mass straight down upon the breastplate, striking it so hard this time that he hurt his head. Still no use. He wedged himself between two heavy braces, flipped a loop of tail around the Boskonian's feet, and heaved. The armored form flew across the room, struck the heavy steel wall, bounced, and dropped. The bulges of the armor were flattened by the force of the collision, the wall was dented—but the thought-screen still held!

Worsel was running out of time, fast. He couldn't treat the thing very much rougher without killing him, if he wasn't dead already. He couldn't take him aboard; he *had* to cut that screen here and now! He could see how the armor was put together; but, armored as he was, he could not take it apart. And, since the whole ship was empty of air, he could not open his own.

Or could he? He could. He could breathe space long enough to do what had to be done. He cut off his air, loosened a plate enough to release four or five gnarled hands, and, paying no attention to his involuntarily laboring lungs, set furiously to work. He tore open the Boskonian's armor, snapped off his thought-screen. The creature was not quite dead yet—good! He didn't know a thing, though, nor did any member of his crew, except . . . yes, one man—a big shot—had got away. Who or what, was he?

"Tell me!" Worsel demanded, with the full power of mind and Lens, even while he was exploring with all his skill and speed. "TELL ME!"

But the Boskonian was dying fast. The ungentle treatment, and now the lack of air, were taking toll. His patterns were disintegrating by the second, faster and faster. Meaningless blurs, which, under Worsel's vicious probing, condensed into something which seemed to be a Lens.

A *Lensman?* Impossible—starkly unthinkable! But jet back

—hadn't. Kim intimated a while back that there might be such things as Black Lensmen?

But Worsel himself wasn't feeling so good. He was only half conscious. Red, black, and purple spots were dancing in front of every one of his eyes. He sealed his suit, turned on his air, gasped, and staggered. Two of the nearest Velantians, all of whom had, of course, been *en rapport* with him throughout, came rushing to his aid; arriving just as he recovered full control.

"Back to the *Velan*, everybody!" he ordered. "No time for any more fun—we've got to get that lifeboat!" Then, as soon as he had been obeyed: "Bomb that hulk . . . good. Flit!"

Overtaking the lifeboat did not take long. Spearing it with a tractor and yanking it alongside required only seconds. For all his haste, Worsel found in it only something that looked as though it once might have been a Delgonian Lensman. It had blown itself apart with a grenade. Because of its reptilian teriacity of life, however, it was not quite dead; its Lens still showed an occasional flicker of light and its shattered mind was not yet entirely devoid of patterns. Worsel studied that mind until all trace of life had vanished, then again reported to the Co-ordinator.

". . . so you see I guessed wrong. The Lens was too dim to read, but he must have been a Black Lensman. The only readable thought in his mind was an extremely fuzzy one of the planet Lyrane IX. I hate to have hashed the job up so—especially since I had one chance in two of guessing right."

"Well, no use in squawking now." Kinnison paused in thought. "Besides, he could have done it anyway, and would have. You haven't done so badly, at that. You found a Black Lensman who is not a Kalonian, and you've got confirmation of Boskonian interest in Lyrane IX. What more do you want? Stick around fairly close to the Hell Hole, Slim, and as soon as I can make it, I'll join you there."

XX.

"Boys, take her upstairs," Kinnison-Thyron ordered, and the tremendous raider—actually the *Dauntless* in disguise—floated serenely upward to a station immediately astern of the vice admiral's flagship. All three courses of multi-ply defensive screen were out, as were full-coverage spy-ray blocks and thought-screens.

As the fleet blasted in tight formation for Kalonia III, Vice Admiral Mendonai tested the *Dauntless*' defenses thoroughly, and found them bottle-tight. No intrusion was possible. The only open channel was that one plate-to-plate, the other end of which was so villainously fogged that nothing could be seen except Bradlow Thyron's face. Convinced at last of that fact, Mendonai sat back and seethed quietly, his pervasive Kalonian blueness pointing up his grim and vicious mood.

He had never, in all his long life, been insulted so outrageously. Was there anything—*anything!*—he could do about it? There was not. Thyron, personally, he could not touch—yet—and the fact that the outlaw had so brazenly and so nonchalantly placed his vessel in the exact center of the Boskonian fleet made it pellucidly clear to any Boskonian mind that he had nothing whatever to fear from that fleet.

Wherefore the Kalonian seethed, and his minions stepped ever more softly and followed with ever-increasing punctilio the rigid Boskonian code. For the grapevine carries news swiftly; by this time the whole fleet knew that His Nibs had been taking a God-awful kicking around, and that the first guy who gave him an excuse to blow off steam would be lucky if he only got boiled in oil.

As the fleet spread out for inert maneuvering above the Kalonian stratosphere, Kinnison turned again to the young Lensman.

"One last word, Frank. I am as sure as I can be that I am fully covered—a lot of smart people worked on this problem. Nevertheless, something may happen, so I will send you the data as fast as I get it. Remember what I told you before—if I get the dope we need, I'm expendable and it'll be your job to get it back to Base. No heroics. Is that clear?"

"Yes, sir." The young Lensman gulped. "I hope, though, that it doesn't—"

"So do I," Kinnison grinned as he climbed into his highly special dureum armor, "and the chances are a million to one that it won't. That's why I'm going down there."

In their respective speedsters Kinnison and Mendonai made the long drop to the ground, and side by side they went into the office of Black Lensman Melasnikov. That worthy, too, wore heavy armor; but he did not have a mechanical thought-screen. Arrogantly conscious of his tremendous power of mind, what did any Black Lensman need of mechanical shields? Thyron, of course, did; a fact of which Melasnikov became instantly aware.

"Release your screen," he directed, brusquely.

"Not yet, pal—don't be so hasty," Thyron advised. "There're some things about this here hookup that I don't exactly like. We got quite a bit of talking to do before I open up."

"No talk, worm. Talk, especially your talk, is entirely meaningless. From you I want, and will have, the truth, and not talk. CUT THOSE SCREENS!"

And lovely Kathryn, in her speedster not too far away, straightened up and sent out a call.

"Kit . . . Kay . . . Cani . . . Con—are you free?" They were, for the moment. "Stand by, please, all of you. I'm pretty sure something is going to happen. Dad can handle this Melasnikov easily enough, if none of the higher-ups step in, but they probably will. Their Lens-

men are probably important enough to rate protection. Check?"

"Check."

"So, as soon as Dad begins to get the best of the argument, the protector will step in," Kathryn continued, "and whether I can handle him alone or not depends on how high a higher-up they send in. So I'd like to have you all stand by for a minute or two, just in case."

How different was Kathryn's attitude now than it had been in the hyperspatial tube! And how well for Civilization that it was!

"Hold it, kids. I've got a thought," Kit suggested. "We've never done any teamwork since you became able to handle heavy stuff, and we'll have to get in some practice before the big blow-off. What say we link up now, on this?"

"Oh, yes!" "Let's do!" "Take over, Kit!" Three approvals came as one, and:

"QX," came Kathryn's less enthusiastic concurrence, a moment later. Naturally enough, she would rather do it alone if she could; but she had to admit that her brother's plan was the better.

Kit laid out the matrix and the four girls came in. There was a brief moment of snuggling and fitting; then each of the Five caught his breath in awe. This was new—brand new. Each had thought himself complete and full; each had supposed that much practice and at least some give-and-take would be necessary before they could work efficiently as a group. But this! This was the supposedly unattainable—perfection itself! This was UNITY—full; round; complete. No practice was or ever would be necessary. Not one micro-microsecond of doubt or of uncertainty would or ever could exist. This was the UNIT, a thing for which there are no words in any written or spoken language; a thing theretofore undreamed-of save as a purely theoretical concept in an unthinkably ancient, four-ply Arisian brain.

"U.m.n.g.n.k," Kit swallowed a lump as big as his fist before he could think. "This, kids, is really some—"

"Ah, children, you have done it." Mentor's thought rolled smoothly in. "You now understand why I could not attempt to describe the Unit to any one of you. This is the culminating moment of my life—of our lives, we may now say. For the first time in more years than you can understand, we are at last sure that our lives have not been lived in vain. But attend—that for which you are waiting will soon be here."

"What is it?" "Who?" "Tell us how to—"

"We cannot." Four separate Arisians smiled as one—a wash of ineffable blessing and benediction suffused the Five. "We, who made the Unit possible, are almost completely ignorant of the details of its higher functions. But that it will need no help from our lesser minds is certain; it is the most powerful and the most nearly per-

fect creation this Universe has ever seen."

The Arisians vanished; and, even before Kimball Kinnison had released his screen, a cryptic, utterly untraceable and all-pervasive foreign thought came in.

To aid the Black Lensman? To study this disturbing new element? Or merely to observe? Or what? The only certainty was that that thought was coldly, clearly, and highly inimical to all Civilization.

Again everything happened at once. Karen's impenetrable block flared into being—not instantly, but instantaneously. Constance assembled and hurled, in the same lack of time, a mental bolt of whose size and power she had never dreamed herself capable. Camilla, the detector-scanner, synchronized herself with the attacking thought and steered. And Kathryn and Kit, with all the force, all the will, and all the drive of human heredity, got behind it and pushed.

Nor was this, any of it, conscious individual effort. The children of the Lens were not now five, but one. This was the Unit at work; doing its first job. It is literally impossible to describe what happened; but each of the Five knew that one would-be Protector, wherever he had been in space or whenever in time, would never think again. Seconds passed. The Unit held tense, awaiting the riposte. No riposte came.

"Fine work, kids!" Kit broke the linkage and each girl felt hard, brotherly pats on her back. "That's all there is to this one, I guess—must have been only one guard on duty. You're good eggs, and I like you. *How* we can operate now!"

"But it was too easy, Kit!" Kathryn protested. "Too easy by far for it to have been an Eddorian. We aren't that good. Why, I could have handled him alone . . . I think," she added, hastily, as she realized that she, although an essential part of the Unit, had as yet no real understanding of what that Unit really was.

"You *hope*, you mean!" Constance jeered. "If that bolt was as big and as hot as I'm afraid it was, anything it hit would have looked easy. Why didn't you slow us down, Kit? You're supposed to be the Big Brain, you know. As it was, we haven't the faintest idea of what happened. Who was he, anyway?"

"Didn't have time," Kit grinned. "Everything got out of hand. All of us were sort of inebriated by the exuberance of our own enthusiasm, I guess. Now that we know what our speed is, though, we can slow down next time—if we want to. As for your last question, Con, you're asking the wrong guy. Was it an Eddorian, Cam, or not?"

"What difference does it make?" Karen asked.

"On the practical side, none. For the completion of the picture, maybe a lot. Come in, Cam."

"It was not an Eddorian," Camilla decided. "It was not of Arisian, or even near-Arisian, grade. Sorry to say it, Kit, but

it was another member of that high-thinking race that you've already got down on Page One of your little black book."

"I thought it might be. The missing link between Kalonia and Eddore. Credits to millos it's that dopey planet Ploor that Mentor was yowling about."

"Let's link up and let the Unit find it," Constance suggested, brightly. "That'd be fun."

"Act your age, baby," Kit advised. "Ploor is taboo—you know that as well as I do. Mentor told us all not to try to investigate it—that we'd learn of it in time, so we probably will. I told him a while back that I was going to hunt it up myself, and he told me that if I did he'd tie both my legs around my neck in a lovers' knot, or words to that effect. Sometimes I'd like to half-brain the old buzzard, but everything he has said so far has dead-centered the beam. We'll just have to take it, and try to like it."

Kinnison was eminently willing to cut his thought-screen, since he could not work through it to do what had to be done here. Nor was he over-confident. He knew that he could handle the Black Lensman—*any* Black Lensman—but he also knew enough of mental phenomena in general and of Lensmanship in particular to realize that Melasnikov might very well have within call reserves about whom he, Kinnison, could know nothing. He knew that he had lied outrageously to young Frank in regard to the odds applicable to this enterprise; that instead of a million to one, the actuality was one to one, or even less.

Nevertheless, he was well content. He had neither lied nor exaggerated in saying that he himself was expendable. That was why Frank and the *Dauntless* were upstairs now. Getting the dope and getting it back to Base were what mattered. Nothing else did.

He was coldly certain that he could get all the information that Melasnikov had, once he had engaged the Kalonian Lensman mind to mind. No Boskonian power or thing, he was convinced, could treat him rough enough to kill him fast enough to keep him from doing that. And he could and would shoot the stuff along to Frank as fast as he got it. And he stood an even—almost even, anyway—chance of getting away afterward. If he could, QX. If he couldn't . . . well, that would have to be QX, too.

Kinnison flipped his switch and there ensued a conflict of wills that made the subether boil. The Kalonian was one of the strongest, hardest, and ablest individuals of his hellishly capable race; and the fact that he believed implicitly in his own complete invulnerability operated to double and to quadruple his naturally tremendous strength.

On the other hand, Kimball Kinnison was a Second-Stage Lensman of the Galactic Patrol.

Back and back, then, inch by inch and foot by foot, the Black

Lensman's defensive zone was forced; back to and down into his own mind. And there, appallingly enough, Kinnison found almost nothing of value.

No knowledge of the higher reaches of the Boskonian organization; no hint that any real organization of Black Lensmen existed; only the peculiarly disturbing fact that he had picked up his Lens on Lyrane IX. And "picked up" was literal. He had not seen, nor heard, nor had any dealings of any kind with anyone while he was there.

Since both armored figures stood motionless, no sign of the tremendous actuality of their mental battle was evident. Thus the Boskonians were not surprised to hear their Black Lensman speak.

"Very well, Thyron, you have passed this preliminary examination. I know all that I now need to know. I will accompany you to your vessel, to complete my investigation there. Lead the way."

Kinnison did so, and as the speedster came to rest inside the *Dauntless* the Black Lensman addressed Vice Admiral Mendonai via plate.

"I am taking Bradlow Thyron and his ship to the space yards on Four, where a really comprehensive study of it can be made. Return to and complete your original assignment."

"I abase myself, Your Supremacy, but . . . but I . . . I *discovered* that ship!" Mendonai protested.

"Granted," the Black Lensman sneered. "You will be given full credit in the report for what you have done. The fact of discovery, however, does not excuse your present conduct. Go—and consider yourself fortunate that, because of that service, I forbear from disciplining you for your intolerable insubordination."

"I abase myself, Your Supremacy. I go." He really did abase himself, this time, and the fleet disappeared.

Then, the mighty *Dauntless* safely away from Kalonia and on her course to rendezvous with the Velan, Kinnison again went over his captive's mind; line by line and almost cell by cell. It was still the same. It was still Lyrane IX and it still didn't make any kind of sense. Since Boskonians were certainly not supermen, and hence could not possibly have developed their own Lenses, it followed that they must have obtained them from the Boskonian counterpart of Arisia. Hence, Lyrane IX must be IT—a conclusion which was certainly fallacious—r i d i c u l o u s—preposterous — utterly untenable. Lyrane IX never had been, was not, and never would be the home of any Boskonian super-race. Nevertheless, it was a definite fact that Melasnikov had got his Lens there. Also, if he had ever had any special training, such as any Lensman must have had, he didn't have any memory of it. Nor did he carry any scars of surgery. What a hash! How could *any-*

body make any sense out of such a mess as that?

Ever-watchful Kathryn, eyes narrowed now in concentration, could have told him, but she did not. Her visualization was beginning to clear up. Lyrane was out. So was Ploor. The Lenses originated on Eddore; that was certain. The fact that their training was subconscious weakened the Black Lensmen in precisely the characteristics requisite for ultimate strength—although probably neither the Eddorians nor the Ploorans, with their warped, Boskonian sense of values, realized it. The Black Lensmen would never constitute a serious problem. QX.

The time of rendezvous approached. Kinnison, having attended to the unpleasant but necessary job of resolving Belasnikov into his component atoms, turned to his Lensman-aide.

"Hold everything, Frank, until I get back. This won't take long."

Nor did it, although the outcome was not at all what the Gray Lensman had expected.

Kinnison and Worsel, in an inert speedster, crossed the Hell Hole's barrier web at a speed of only miles per hour, and then slowed down. The ship was backing in on her brakes, with everything set to hurl her forward under full drive should either Lensman flick a finger. Kinnison could feel nothing, even though, being *en rapport* with Worsel, he knew that his friend was soon suffering intensely.

"Let's flit," the Gray Lensman suggested, and threw on the drive. "I probed my limit, and couldn't touch or feel a thing. Had enough, didn't you?"

"More than enough—I couldn't have taken much more."

Each boarded his ship; and as the *Dauntless* and the *Velan* tore through space toward far Lyrane, Kinnison paced his room, scowling in black abstraction. Nor would a mind reader have found his thoughts either cogent or informative.

"Lyrane IX . . . LYRANE IX . . . Lyrane IX . . . LYRANE IX . . . and something that I can't even feel or perceive, but that kills anybody and everybody else . . . KLONO'S tungsten TEETH and CURVING CARBALLOY CLAWS! ! !"

XXI.

Helen's story was short and bitter. Human or near-human Boskonians came to Lyrane II and spread insidious propaganda all over the planet. Lyranian matriarchy should abandon its policy of isolationism. Matriarchs were the highest type of life. Matriarchy was the most perfect of all existing forms of government—why keep on confining it to one small planet, when it should by right be ruling the entire Galaxy? The way things were, there was only one Elder Person; all other Lyranians, even though better qualified than the then incumbent, were nothing—and so on. Whereas, if things were as they should be, each

individual Lyranian person could be and would be the Elder Person of a planet at least, and perhaps of an entire solar system—and so on. And the visitors, who, they insisted, were no more males than the Lyranian persons were females, would teach them. They would be amazed at how easily, under Boskonian guidance, this program could be put into effect.

Helen fought the intruders with every jet she had. She despised the males of her own race; she detested those of all others. Believing that hers was the only existing matriarchal race, especially since neither Kinnison nor the Boskonians seemed to know of any other, she was sure that any prolonged contact with other cultures would result, not in the triumph of matriarchy, but in its fall. She not only voiced these beliefs as she held them—violently—but also acted upon them in the same fashion.

Because of the ingrained matriarchally conservative habit of Lyranian thought, particularly among the older persons, Helen found it comparatively easy to stamp out the visible manifestations; and, being in no sense a sophisticate, she thought that the whole matter was settled. Instead, she merely drove the movement underground, where it grew tremendously. The young, of course, rebellious as always against the hide-bound, mossbacked, and reactionary older generation, joined the subterranean New Deal in droves. Nor was the older generation solid. In fact, it was riddled by the defection of many thousands who could not expect to attain any outstanding place in the world as it was and who believed that the Boskonians' glittering forecasts would come true.

Disaffection spread, then, rapidly and unobserved; culminating in the carefully-planned uprising which made Helen an Ex-Chief Person and put her into the tower room to await a farcical trial and death.

"I see." Clarrissa caught her lower lip between her teeth. "Very unfunny. . I noticed that you didn't mention or think of any of your persons as ringleaders . . . peculiar that you couldn't catch them, with your telepathy . . . no, natural enough, at that . . . but there's one I want very much to get hold of. Don't know whether she was really a leader, or not, but she was mixed up in some way with a Boskonian Lensman. I never did know her name. She was the wom . . . the person who managed your airport here when Kim and I were—"

"Cleonie? Why, I never thought . . . but it might have, at that . . . yes, as I look back—"

"Yes, hindsight *is* a lot more accurate than foresight," the Red Lensman grinned. "I've noticed that myself, lots of times."

"It *did!* It *was* a leader!" Helen declared, furiously. "I shall have its life, too, the jealous cat—the blood-sucking, back-biting *louse!*"

"She's all of that, in more ways than you know," Clarrissa agreed, grimly, and spread in the Lyranian's

mind the story of Eddie the derelict. "So you see that Cleonie has got to be our starting-point. Have you any idea of where we can find her?"

"I haven't seen or heard anything of Cleonie lately." Helen paused in thought. "If, though, as I am now practically certain, it was one of the prime movers behind this brainless brat Ladora, it wouldn't dare leave the planet for very long at a time. As to how to find it, I don't quite know. Anybody would be apt to shoot me on sight. Would you dare fly this funny plane of yours down close to a few of our cities?"

"Certainly. I don't know of anything around here that my screens and fields can't stop. Why?"

"Because I know of several places where Cleonie might be, and if I can get fairly close to them, I can find it in spite of anything it can do to hide itself from me. But I don't want to get you into too much trouble, and I don't want to get killed myself, either, now that you have rescued me—at least, until after I have killed Cleonie and Ladora."

"QX. What are we waiting for? Which way, Helen?"

"Back to the city first, for several reasons. Cleonie probably is not there, but we must make sure. Also, I want my guns—"

"Guns? No. DeLameters are better. I have several spares." In one fleeting mental contact Clarrissa taught the Lyranian all there was to know about DeLameters. And that feat impressed Helen even more than did the nature and power of the weapon.

"What a mind!" she exclaimed. "You didn't have any such equipment as that, the last time I saw you. Or were you . . . no, you weren't hiding it."

"You're right; I have developed considerably since then. But about guns—what do you want of one?"

"To kill that nitwit Ladora on sight, and that snake Cleonie, too, as soon as you get done with it."

"But why guns? Why not the mental force you always used?"

"Except by surprise, I couldn't," Helen admitted, frankly. "All adult persons are of practically equal mental strength. But speaking of strength, I marvel that a craft as small as this should be able to ward off the attack of one of those tremendous Boskonian ships of space."

"But she *can't!* What made you think she could?"

"Your own statement—or were you thinking of purely Lyranian dangers, not realizing that Ladora, of course, called Cleonie as soon as you showed your teeth, and that Cleonie as surely called the Lensman or some other Boskonian? And that they must have ships of war not too far away?"

"Heavens, no! It never occurred to me!"

Clarrissa thought briefly. It wouldn't do any good to call Kim. Both the *Dauntless* and the *Velan* were coming, as fast as they could come, but it would be a day or so

yet before they arrived. Besides, he would tell her to lay off, which was exactly what she was not going to do. She turned her thought back to the matriarch.

"Two of our best ships are coming, and I hope they get here first. In the meantime, we'll just have to work fast and keep our detectors full out. Anyway, Cleonie won't know that I'm looking for her—I haven't even mentioned her to anyone except you."

"No?" pessimistically. "Cleonie knows that *I* am looking for it, and since it knows by now that I am with you, it would think that both of us were hunting it even if we weren't. But we are nearly close enough now; I must concentrate. Fly around quite low over the city, please."

"QX. I'll tune in with you, too. 'Two heads,' you know." Clarrissa learned Cleonie's pattern, tuned to it, and combed the city while Helen was getting ready.

"She isn't here, unless she's behind one of those thought-screens," the Red Lensman remarked. "Can you tell?"

"Thought-screens! The Boskonians had a few of them, but none of us ever did. How can you find them? Where are they?"

"One there—two over there. They stick out like big black spots on a white screen. Can't you see them? I supposed that your scanners were the same as mine, but apparently they aren't. Take a quick peek at them with the spy—you work it like so. If they've got spy-ray blocks up, too, we'll have to go down there and blast."

"Politicians only," Helen reported, after a moment's manipulation of the suddenly familiar instrument. "They need killing, of course, on general principles, but perhaps we shouldn't take time for that now. The next place to look is a few degrees east of north of here."

Cleonie was not, however, in that city. Nor in the next, nor the next. But the speedster's detector screens remained blank and the two allies, so much alike physically, so different mentally, continued their hunt. There was opposition, of course—all that the planet afforded—but Clarrissa's second-stage mind took care of the few items of offense which her speedster's defenses could not handle.

Finally two things happened almost at once. Clarrissa found Cleonie, and Helen saw a dim and fuzzy white spot upon the lower left-hand corner of the detector plate.

"Can't be ours," the Red Lensman decided instantly. "Almost exactly the wrong direction. Boskonians. Ten minutes—twelve at most—before we have to flit. Time enough—I hope—if we work fast."

She shot downward, going inert and matching intrinsics at a lack of altitude which would have been suicidal for any ordinary pilot. She rammed her beryllium-bronze torpedo through the first-floor wall of a forbidding, almost windowless building—its many stories of mas-

sive construction, she knew, would help no end against the heavy stuff so sure to come. Then, while every hitherto-hidden offensive arm of the Boskone-coached Lyranians converged, screaming through the air and crashing and clanking along the city's streets, Clarrissa probed and probed and probed. Cleonie had locked herself into a veritable dungeon cell in the deepest sub-basement of the structure. She was wearing a thought-screen, too, but she had been releasing it, for an instant at a time, to see what was going on. One of those instants was enough—that screen would never work again. She had been prepared to kill herself at need; but her full-charged weapons emptied themselves futilely against a massive lock and she threw her vial of poison across the corridor and into an empty cell.

So far, so good; but how to get her out of there? Physical approach was out of the question. There must be somebody around, somewhere, with keys, or hacksaws, or sledge-hammers, or something. Ha—oxyacetylene torches! Very much against their wills, two Lyranian mechanics trundled a dolly along a corridor, into an elevator. The elevator went down four levels. The artisans began to burn away a barrier of thick steel bars.

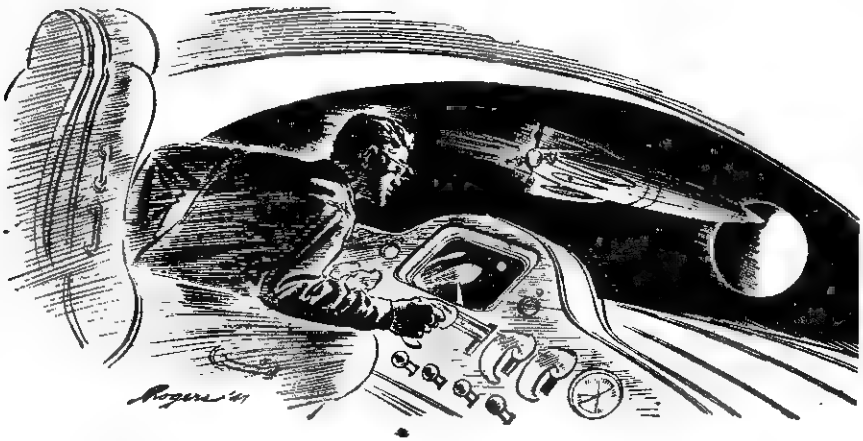
By this time the whole building was rocking to the detonation of high explosive. Much more of that kind of stuff and she would be trapped by the sheer mass of the rubble. She was handling six jackass-stubborn people already and that Boskonian warship was coming fast;- she did not quite know whether she was going to get away with this or not.

But somehow, from the unplumbed and unplumbable depths which made her what she so uniquely was, the Red Lensman drew more and ever more power. Kinnison, who had once made heavy going of handling two-and-a-fraction Lensmen, guessed, but never did learn from her, what his beloved wife really did that day.

Even Helen, only a few feet away, could not understand what was happening. Left parsecs behind long since, the Lyranian could not help in any particular, but could only stand and wonder. She knew that this queerly powerful Lens-bearing Earth-person—white-faced, sweating, strung to the very snapping-point as she sat motionless at her board—was exerting some terrible, some tremendous force. She knew that the heaviest of the circling bombers sheered away and crashed. She knew that certain mobile projectors, a few blocks away, did not come any closer. She knew that Cleonie, against every iota of her mulish Lyranian will, was coming toward the speedster. She knew that many persons, who wished intensely to bar Cleonie's progress or to shoot her down, were physically unable to act. She had no faint idea, however, of how such work could possibly be done.

Cleonie came aboard and Clarrissa snapped out of her trance. The speedster nudged and blasted

its way out of the wrecked stronghold, then tore a hole through protesting air into open space. Clarrissa shook her head, wiped her face, studied a tiny double dot in the corner of the plate opposite the one now showing clearly the Boskonian warship, and set her controls.



"We'll make it—I think," she announced. "Even though we're indetectable, they, of course, know our line, and they're so much faster that they'll be able to find us, even on their visuals, before long. On the other hand, they must be detecting our ships now, and my guess is that they won't dare follow us long enough to do us any harm. Keep an eye on things, Helen, while I find out what Cleonie really knows. And while I think of it, what's your real name? It isn't polite to keep on calling you by a name that you never even heard of until you met us."

"Helen." the Lyranian made surprising answer. "I liked it, so I adopted it—officially."

"Oh. That's a compliment, really, to both Kim and me. Thanks."

The Red Lensman then turned her attention to her captive, and as mind fitted itself precisely to mind her eyes began to gleam in gratified delight. Cleonie was a real find; this seemingly unimportant Lyranian knew a lot—an immense lot—about things that no adherent of the Patrol had ever heard before. And she, Clarrissa Kinnison, would be the first of all the Gray Lensmen to learn of them! Therefore, taking her time now, she allowed every detail of the queer but fascinating picture-story to imprint itself upon her mind.

And Karen and Camilla, together in Tregonsee's ship, glanced at each other and exchanged flashing thoughts. Should they interfere? They hadn't had to so far,

but it began to look as though they would have to, now—it would wreck their mother's mind, if she could understand. She probably could not understand it, any more than Cleonie could—but even if she could, she had so much more inherent stability, even than Dad, that she might be able to take it, at that. Nor would she ever leak, even to Dad—and Dad, bless his tremendous boots, was not the type to pry. Maybe, though, just to be on the safe side, it would be better to screen the stuff, and to edit, if necessary, anything about Eddore. The two girls synchronized their minds all imperceptibly with their mother's and Helen's, and learned.

The time was in the unthinkably distant past; the location was unthinkably remote in space. A huge planet circled slowly about a cooling sun. Its atmosphere was not air; its liquid was not water. Both were noxious; composed in large part of compounds even yet unknown to man.

Yet life was there; a race which was even then ancient. Not sexual, this race. Not androgynous, nor hermaphroditic, but absolutely sexless. Except for the many who died by physical or by mental violence, its members lived endlessly. After many hundreds of thousands of years each being, having reached his capacity to live and to learn, divided into two individuals; each of which, although possessing *in toto* the parents' memories, knowledges, skills, and powers, had also a renewed and increased capacity.

And, since life was, there had been competition. Competition for power. Knowledge was desirable only insofar as it contributed to power. Power for the individual—the group—the city. Wars raged—*what* wars!—and internecine strifes which lasted while planets came into being, grew old, and died. And finally, to the few survivors, there came peace. Since they could not kill each other, they combined their powers and hurled them outward—together they would dominate and rule solar systems—regions—the Galaxy itself—the entire macrocosmic Universe.

Amorphous, amoeboid, each could assume at will any imaginable form, could call into being members to handle any possible tool. Nevertheless, as time went on they used their bodies less and less. More and more they used their minds, to bring across gulfs of space and to enslave other races, to labor under their direction. By nature and by choice they were bound to their own planet; few indeed were the planets upon which their race could possibly live. Also, it was easier to rejuvenate their own world, or to move it to a younger sun, than to enforce and to supervise the myriads of man-hours of slave labor necessary to rebuild any planet to their needs. Thus, then, they lived and ruled by proxy an ever-increasing number of worlds.

Although they had long since learned that their asexuality was practically unique, that bisexual life dominated the universe, this knowledge served only to stiffen their de-

termination to rule, and finally to change to their own better standards, that universe. They were still seeking a better proxy race; the more nearly asexual a race, the better. One race, the denizens of a planet of a variable sun, approached that idea closely. So did the Kalonians, whose women had only one function in life—the production of men.

Now these creatures had learned of the matriarchs of Lyrane. That they were physically females meant nothing; to the Eddorians one sex was just as good—or as bad—as the other. The Lyranians were strong; not tainted by the weaknesses which seemed to characterize all races believing in even near-equality of the sexes. Lyranian science had been trying for centuries to do away with the necessity for males; in a few more generations, with some help, that goal could be achieved and the perfect proxy race would have been developed.

It is not to be supposed that this story was obtained in such straightforward fashion as it is presented here. It was dim, murky, confused. Cleonie never had understood it. Clarrissa understood it better, but less accurately; for in the version the Red Lensman received, one minor change was made—in it the Ploorans and the Eddorians were one and the same race! She understood, however, that that actually unnamed and to her unknown race was the highest of Boskone, and the place of the Kalonians in the Boskonian scheme was plain enough.

"I am giving you this story," the Kalonian Lensman told Cleonie coldly, "not of my own free will but because I must. I hate you as much as you hate me. What I would like to do to you, you may imagine. Nevertheless, so that your race may have its chance, I am to take you on a trip and, if possible, make a Lensman out of you. Come with me." And, urged by her jealousy of Helen, her seething ambition, and probably, if the truth were to be known, by an Eddorian mind, Cleonie went.

There is no need to dwell at length upon the horrors, the atrocities, of that trip; of which the matter of Eddie the meteor miner was only a very minor episode. It will suffice to say that Cleonie was very good Boskonian material; that she learned fast and passed all tests successfully.

"That's all," the Black Lensman informed her then, "and I'm glad to see the last of you. You'll get a message when to hop over to Nine and pick up your Lens. Flit—and I hope that the first Gray Lensman you meet will ram his Lens down your throat and turn you inside out."

"The same to you, brother, and many of them," Cleonie sneered. "Or, better, when my race supplants yours as Proxies of Power, I shall give myself the pleasure of doing just that to you."

"Clarrissa! Clarrissa! Pay attention, please!" The Red Lensman came to herself with a start—Helen had been thinking at her,

with increasing power, for seconds. The *Velan's* blunt nose filled half the plate.

In minutes, then Clarrissa and her party were in Kinnison's private quarters in the *Dauntless*. There had been warm mental greetings; physical demonstrations would come later. Worsel broke in.

"Excuse it, Kim, but seconds count. Better we split, don't you think? You find out what the score around here is, from Clarrissa, and take steps, and I'll chase that Boskonian. He's flitting—fast."

"QX, Slim," and the *Velan* disappeared.

"You remember Helen, of course, Kim." Kinnison bent his head, flipping a quick grin at his wife, who had spoken aloud. The Tyranian, trying to unbend, half-offered her hand, but when he did not take it she withdrew it as enthusiastically as she had twenty years before. "And this is Cleonie, the . . . the wench I've been telling you about. You knew her before."

"Yeah. She hasn't changed much—still as unbarbered a mess as ever. If you've got what you want, Chris, we'd better—"

"Kimball Kinnison, I demand Cleonie's life!" came Helen's vibrant thought. She had snatched one of Clarrissa's DeLameters and was swinging it into line when she was caught and held as though in a vise.

"Sorry, Toots," the Gray Lensman's thought was more than a little grim. "Nice little girls don't play so rough. 'Scuse me, Chris, for dipping into your dish. Take over."

"Do you really mean that, Kim?"

"Yes. It's your meat—slice it as thick or as thin as you please."

"Even to letting her go?"

"Check. What else could you do? In a lifeboat—I'll even show the jade how to run it."

"Oh, Kim—"

"Quartermaster! Kinnison. Please check Number Twelve lifeboat and break it out. I am loaning it to Cleonia of Tyrane II."

XXII.

Kit had decided long since that it was his job to scout the planet Eddore. His alone. He had told several people that he was en route there, and in a sense he had been, but he was not hurrying. Once he started *that* job, he knew that he would have to see it through with absolutely undisturbed attention, and there had been altogether too many other things popping up. Now, however, his visualization showed a couple of weeks of free time, and that would be enough. He wasn't sure whether he was grown-up enough yet to do a man's job of work or not, and Mentor wouldn't tell him. This was the best way to find out. If so, QX. If not, he would back off, wait, and try again later.

The kids had wanted to go along, of course.

"Come on, Kit, don't be a pig!" Constance started what developed into the last violent argument of their long lives. "Let's gang up on

it—think what a grand work-out that would be for the Unit!"

"Uh-uh, Con. Sorry, but it isn't in the cards, any more than it was the last time we discussed it," he began, reasonably enough.

"We didn't agree to it then," Kay cut in, stormily, "and I for one am not going to agree to it now. You don't have to do it today. In fact, later on would be better. Anyway, Kit, I'm telling you right now that if you go in, we all go, as individuals if not as the Unit."

"Act your age, Kay," he advised. "Get conscious. This is one of the two places in the Universe that can't be worked from a distance, and by the time you could get here I'll have the job done. So what difference does it make whether you agree or not? I'm going in now and I'm going in alone. Pick *that* one out of your pearly teeth!"

That stopped Karen, cold—they all knew that even she would not endanger the enterprise by staging a useless demonstration against Eddore's defensive screens — but there were other arguments. Later, he was to come to see that his sisters had some right upon their side, but he could not see it then. None of their ideas would hold air, he declared, and his temper wore thinner and thinner.

"No, Cam—NO! You know as well as I do that we can't all be spared at once, either now or at any time in the near-enough future. Kay's full of pickles, and you all know it. Right now is the best time I'll ever have.

"Seal it, Kat—you *can't* be that dumb! Taking the Unit in would blow things wide open. There isn't a chance that I can get in, even alone, without touching *something* off. I, alone, won't be giving too much away, but the Unit would be a flare-lit tip-off and all hell would be out for noon. Or are you actually nitwitted enough to think that, all Arisia to the contrary, we are ready for the grand showdown?

"Hold it, all of you! Pipe down!" he snorted, finally. "Have I got to bash in your skulls to make you understand that I can't co-ordinate an attack against something without even the foggiest idea of what its' actual physical setup is? Use your brains, kids—*please* use your brains!"

He finally won them over, even Karen; and while his speedster covered the last leg of the flight he completed his analysis.

He had all the information he could get—in fact, all that was available—and it was pitifully meager and confusingly contradictory in detail. He knew the Arisians, each of them, personally; and had studied, jointly and severally, the Arisian visualizations of the ultimate foe. He knew the Lyranian impression of the Plooran version of the story of Eddore. Ploor! Merely a name. A symbol which Mentor had always kept rigorously apart from any Boskonian actuality. Ploor *must* be the missing link between Kalonia and Eddore. And he knew practically everything about it except the two really important facts —whether or not it really was that link, and where, within eleven thou-

sand million parsecs, it was in space!

He and his sisters had done their best. So had many librarians; who had found, not at all to his surprise, that no scrap of information or conjecture concerning Eddore or the Eddorians was to be found in any library, however comprehensive or exclusive.

Thus he had guesses, hypotheses, theories, and visualizations galore; but none of them agreed and not one of them was convincing. He had no real facts whatever. Mentor had informed him, equably enough, that such a state of affairs was inevitable because of the known power of the Eddorian mind. That state, however, did not make Kit Kinnison any too happy as he approached dread and dreaded Eddore. He was in altogether too much of a dither as to what, actually, to expect.

As he neared the boundary of the star cluster within which Eddore lay, he cut his velocity to a crawl. An outer screen, he knew, surrounded the whole cluster. How many intermediate protective layers existed, where they were, or what they were like, nobody knew. That information was only a small part of what he had to have.

His far-flung detector web, at practically zero power, touched the barrier without giving alarm and stopped. His speedster stopped. Everything stopped.

Christopher Kinnison, the matrix and the key element of the Unit, had tools and equipment about which even Mentor of Arisia knew nothing in detail; about which, it was hoped and believed, the Eddorians were completely in ignorance. He reached deep into the storehouse toolbox of his mind, arranged his selections in order, and went to work.

He built up his detector web, one infinitesimal increment at a time, until he could just perceive the structure of the barrier. He made no attempt to analyze it, knowing that any fabric or structure solid enough to perform such an operation would certainly touch off an alarm. Analysis could come later, after he had found out whether the generator of this outer screen was a machine or a living brain.

He felt his way along the barrier—slowly—carefully. He completely outlined one section, studying the fashion in which the joints were made and how it must be supported and operated. With the utmost nicety of which he was capable he synchronized a probe with the almost impossibly complex structure of the thing and slid it along a feeder beam into the generator station. A mechanism—they didn't waste live Eddorians, then, any more than the Arisians did, on outer defenses. QX.

A precisely tuned blanket surrounded his speedster—a blanket which merged imperceptibly into, and in effect became an integral part of, the barrier itself. The blanket thinned over half of the speedster. The speedster crept forward. The barrier—unchanged, unaffected—was *behind* the speedster. Man and vessel were through!

Kit breathed deeply in relief and rested. This didn't prove much, of course. Nadreck had done practically the same thing in getting Kandron—except that the Palainian would never be able to analyze or to synthesize such screens as these. The real test would come later; but this had been mighty good practice.

The real test came with the fifth, the innermost screen. The others, while of ever-increasing sensitivity, complexity, and power, were all generated mechanically, and hence posed problems differing only in degree, and not in kind, from that of the first. The fifth problem, however, involving a living and highly capable brain, differed in both degree and kind from all the others. The Eddorian would be sensitive to form and to shape, as well as to interference. Bulges were out, unless he could do something about the Eddorian—and the speedster couldn't go through a screen without making a bulge.

Furthermore, this zone had visual and electromagnetic detectors, so spaced as not to let a microbe through. There were fortresses, maulers, battleships, and their attendant lesser craft. There were projectors, and mines, and automatic torpedoes with atomic warheads, and other such things. Were these things completely dependent upon the Eddorian guardian, or not?

They were not. The officers—Kalonians for the most part—would go into action at the guardian's signal, of course; but they would at need act without instructions. A nice setup—a mighty hard nut to crack! He would have to use zones of compulsion. Nothing else would do.

Picking out the biggest fortress in the neighborhood, with its correspondingly large field of coverage, he insinuated his mind into that of one observing officer after another. When he left, a few minutes later, he knew that none of those officers would initiate any action in response to the alarms which he would so soon set off. They were alive, fully conscious, alert, and would have resented bitterly any suggestion that they were not completely normal in every respect. Nevertheless, whatever colors the lights flashed, whatever pictures the plates revealed, whatever noises blared from the speakers, in their consciousnesses would be only blankness and silence. Nor would recorder tapes reveal later what had occurred. An instrument cannot register fluctuations when its movable member is controlled by a couple of steady fingers.

Then the Eddorian. To take over his whole mind was, Kit knew, beyond his present power. A partial zone, though, could be set up—and young Kinnison's mind had been developed specifically to perform the theretofore impossible. Thus the guardian, without suspecting it, suffered an attack of partial blindness which lasted for the fraction of a second necessary for the speedster to flash through the screen. And there was no recorder to worry about. Eddorians, never sleeping and never relaxing their vigilance, had no doubt whatever of their own

capabilities and needed no checks upon their own performances.

Christopher Kinnison, Child of the Lens, was inside Eddore's innermost defensive sphere. For countless cycles of time the Arisians had been working toward and looking forward to the chain of events of which this was the first link. Nor would he have much time here: he would have known that even if Mentor had not so stressed the point. As long as he did nothing, he was safe; but as soon as he started sniffing around he would be open to detection and some Eddorian would climb his frame in mighty short order. Then blast and lock on—he might get something, or a lot, or nothing at all. Then—win, lose, or draw—he had to get away. Strictly under his own power, against an unknown number of the most powerful and the most ruthless entities ever to live. The Arisian couldn't get in here to help him, and neither could the kids. Nobody could. It was strictly and solely up to him.

For more than a moment his spirit failed. The odds against him were far too long. The load was too heavy; he didn't have half enough jets to swing it. Just how did a guy as smart as Mentor figure it that he, a dumb, green kid, stood a chance against all Eddore?

He was scared; scared to the core of his being; scared as he had never been before and never would be again. His mouth felt dry, his tongue cottony. His fingers shook, even as he doubled them into fists to steady them. To the very end of his long life he remembered the fabric and the texture of that fear; remembered how it made him decide to turn back, before it was too late to retrace his way as unobserved as he had come.

Well, why not? Who would care, and what matter? The Arisians? Nuts! It was all their fault, sending him in half-ready. His parents? They wouldn't know what the score was and wouldn't care. They would be on his side, anyway, no matter what happened. The kids? The *kids!* Klono's Holy Claws!

They had tried to talk him out of coming in alone. They had fought like wildcats to make him take them along. He had refused. Now, if he sneaked back with his tail between his legs, how would they take it? What would they do? What would they *think?* Then, later, after he had loused up the big job and let the Arisians and the Patrol and all Civilization get knocked out—then what? The kids would know exactly how and why it had happened. He couldn't defend himself, even if he tried, and he wouldn't try. Did he have any idea how much sheer, vitriolic, corrosive contempt those four red-headed hellions could generate? Or, even if they didn't—or as a follow-up—their condescending, sisterly pity would be a thousand million times worse. And what would he think of himself? No soap. It was out. Definitely. The Eddorians could kill him only once. QX.

He drove straight downward, noting as he did so that his senses were clear, his hands steady, his

tongue normally moist. He was still scared, but he was no longer paralyzed.

Low enough, he let his every perceptive sense roam abroad—and became instantly too busy to worry about anything. There was an immense amount of new stuff here—if he only could be granted time enough to get it all!

He wasn't. In a second or so, it seemed, his interference was detected and an Eddorian came in to investigate. Kit threw everything he had, and in the brief moment before the completely surprised denizen died, the young Klovian learned more of the real truth of Eddore and of the whole Boskonian Empire than all the Arisians had ever found out. In that one flash of ultimately intimate fusion, he *knew* Eddorian history, practically *in toto*. He knew the enemies' culture; he knew how they behaved, and why. He knew their ideals and their ideologies. He knew a great deal about their organization; their systems of offense and of defense. He knew their strengths and, more important, their weaknesses. He knew exactly how, if Civilization were to triumph at all, its victory must be achieved.

This seems—or rather, it is—incredible. It is, however, simple truth. Under such stresses as those, an Eddorian mind can yield, and the mind of such a one as Christopher Kinnison can absorb, an incredible amount of knowledge in an incredibly brief interval of time.

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Kit, already seated at his controls, cut in his every course of thought-screen. They would help a little in what was coming, but not much—no mechanical screen then known to Civilization could block third-level thought. He kicked in full drive toward the one small area in which he and his speedster would not encounter either beams or bombs—the fortress whose observers would not perceive that anything was amiss. He did not fear physical pursuit, since his speedster was the fastest thing in space.

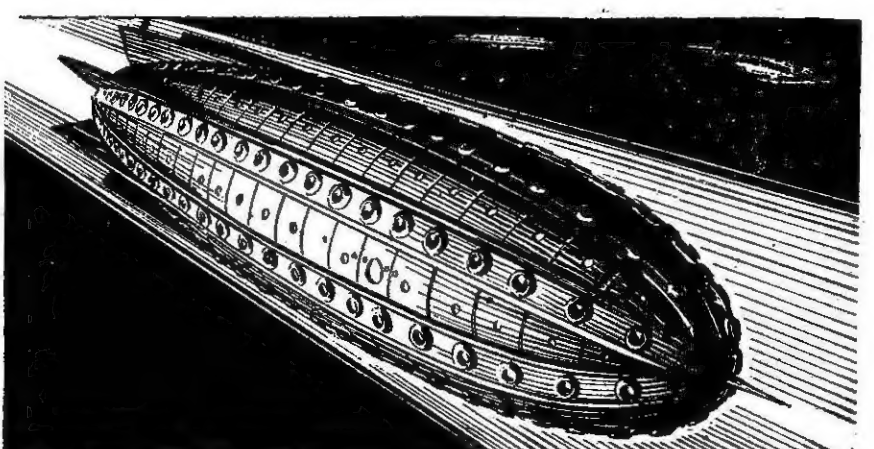
For a second or so it was not so bad. Another Eddorian came in, suspicious and on guard. Kit blasted him down—learning still more in the process—but he could not prevent him from radiating a frantic and highly revealing call for help. And although the other Eddorians could scarcely realize that such an astonishing thing as a physical invasion had actually happened, that fact neither slowed them down nor made their anger less violent.

When Kit flashed past his friendly fortress he was taking about all that he could handle, and more and more Eddorians were piling on. At the fourth screen it was worse; at the third he reached what he was sure was his absolute ceiling. Nevertheless, from some hitherto unsuspected profundity of his being, he managed to draw enough reserve force to endure that hellish punishment for a little while longer.

Hang on, Kit, hang on! Only two more screens to go. Maybe only one. Maybe less. Living Eddorian brains, and not mechanical generators, are now handling all the screens, of course; but if Mentor's visualization is worth a tinker's damn, he must have that first screen knocked down by this time and must be working on the second. Hang on, Kit, and keep on slugging!

And grimly—doggedly—toward the end sheerly desperately—Christopher Kinnison, eldest Child of the Lens, hung on and slugged.

TO BE CONCLUDED.



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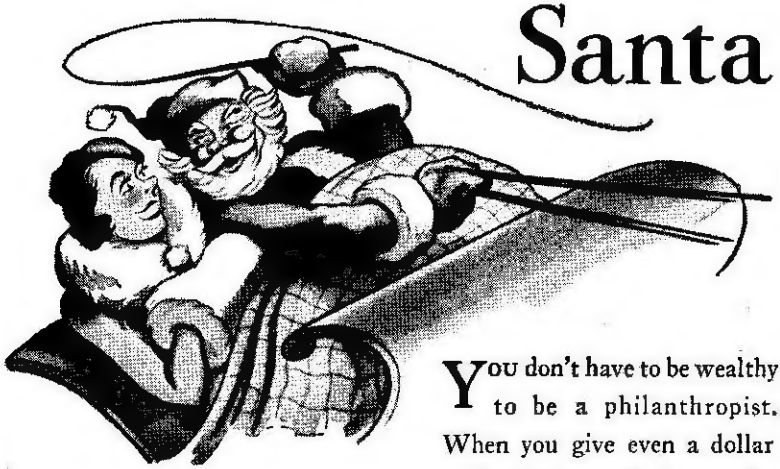

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